

# THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume X

OCTOBER, 1937

No. 8

## COMPLETE CONGRESS PROGRAM IN THIS ISSUE

### A Message From the President

**T**HE one best wish that I can extend to you at this season is that all engaged in the metal industry may be able to attend the National Metal Congress and Exposition at Atlantic City, Oct. 18 to 22. The benefits to be derived from attendance warrant a very considerable effort to be present.

The American Society for Metals, in cooperation with the American Welding Society, the Wire Association, the American Institute of Mining and Metallurgical Engineers, and the American Society of Mechanical Engineers, will present about 145 practical and technical papers, grouped by topics in appropriate sessions. These carefully prepared papers are significant contributions to the current literature on technical fundamentals and the science of metals.

The 250 exhibits at the Exposition conveniently present, for your thorough acquaintance, up-to-the-minute commercial advances in metals as used in industry.

Special lecture courses attract alike beginners and the experienced men who wish an authoritative review of two important metallurgical subjects.

Perhaps the item of greatest importance is the personal contacts with others of similar interests who are glad to exchange experiences.

A cordial invitation is extended to all who are interested in the manufacture or use of metals. May we urge you to attend!

*Edgar C. Bain*  
President,  
American Society for Metals  
New York City, Oct. 1, 1937

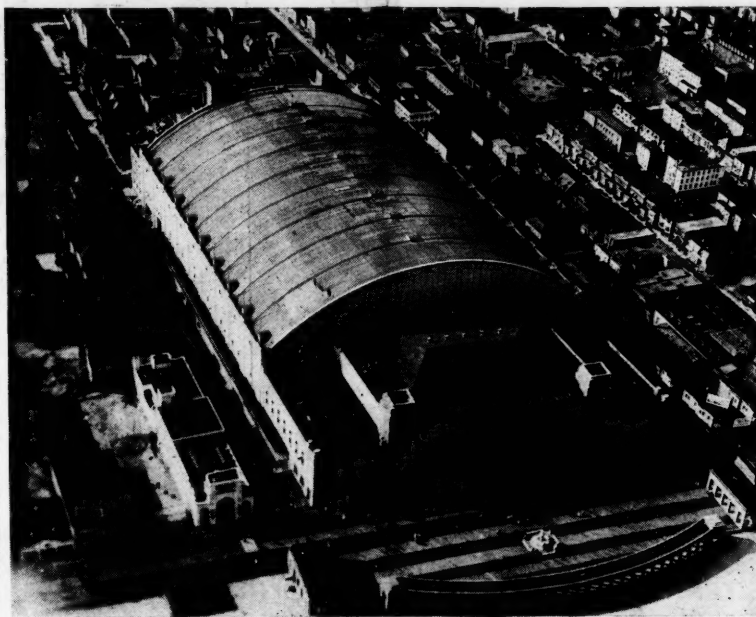
### Breakfast Meetings Help Run Sessions Smoothly

An important factor in the smooth and prompt running of the technical sessions of the American Society for Metals during the annual National Metal Congress is a series of breakfasts held during the Convention.

At these breakfasts, which will be held in Room 104, the Ambassador Hotel, Atlantic City, each morning during the Congress, Oct. 18 to 22, the chairmen and vice-chairmen of the morning and afternoon technical sessions of that day and those who are presenting papers will meet with the chairman of the Publication Committee and A.S.M. Assistant Secretary Ray T. Bayless.

At this time the program for the day is gone over in detail, the discussions to be presented are given consideration, the amount of time allocated for each paper is emphasized, and every detail conducive to a successful and smooth-running meeting is carefully considered.

### A. C. Auditorium Dwarfs Surroundings



Sky View of the Auditorium, Atlantic City, Where the National Metal Exposition Will Be Held Oct. 18 to 22, 1937. Its huge bulk is emphasized by contrast with surrounding buildings (Airview by H. H. Harris, President, General Alloys Co.)

### A. S. M. Offers Varied Technical Program And Other Events for Metal Congress

Ranging all the way from coloring of metals to the A<sub>5</sub> points of iron and iron-nickel alloys, the technical program of the American Society for Metals at the National Metal Congress in Atlantic City the week of Oct. 18 covers an unusually wide variety of subjects.

Forty-three papers are scheduled for presentation during the five days of the Congress. (See page 5 for complete program.) Morning sessions will be held in the Ambassador Hotel at 10:00 o'clock and afternoon sessions in the Auditorium at 2:00 o'clock with the exception of Friday, when all the sessions will be at the Auditorium.

A symposium on carburizing will be an outstanding feature of the program. This will occupy four sessions on Thursday and Friday morning and afternoon and will be held simultaneously with the regular technical sessions.

Wednesday morning is given over to the Annual Meeting of the A.S.M. and presentation of the Campbell Memorial Lecture. Members of the Society will gather in the Renaissance Room of the Ambassador at 10:00 a.m. for installation of new officers and reports of Society activities. The President's Bell will also be presented at this time to the chapter whose activities have been outstanding during the year.

These events will be followed by the Edward de Mille Campbell Memorial Lecture, to be given this year by W. P. Sykes of the Cleveland Wire Works, General Electric Co.

Two lecture courses will supplement the technical program—one on "Open-

#### Bring Membership Cards

Members of the A.S.M., A.I.M.E., A.W.S., A.S.M.E., the Wire Association, or any other technical society should be sure to bring their membership cards to the National Metal Congress in Atlantic City, Oct. 18 to 22. Membership cards are required for admission to the National Metal Exposition and for enrollment in the lecture course.

Hearth Steel Making" by Earnshaw Cook, and a second on "Metallographic Technique" by J. R. Vilella. Details of these courses will be found on page 3.

The Annual Banquet of the Society takes place Thursday, Oct. 21, at 7:00 p.m. At that time the Albert Sauveur Achievement Medal, the Henry Marion Howe Medal and the Past President's Medal will be awarded.

The Canadian Luncheon will be held Tuesday noon, and a group of Alumni Luncheons on Wednesday following the Campbell Lecture. The full program of entertainment for the ladies visiting the Congress will be found on page 2.

### Mammoth Expo Opens Oct. 18 In Atlantic City

Held in Conjunction With National Metal Congress, Mon. Through Fri., October 18 to 22

Sprawling over nearly four acres of floor space—about the equivalent of an ordinary city block—the National Metal Exposition, occupying one of the largest auditoriums in the East, will open in Atlantic City on Monday, Oct. 18.

From then until Friday, Oct. 22, metal men from all over the United States and from abroad will have an opportunity to see and study exhibits of the latest developments in products, processes and equipment displayed by 250 leading firms in the metal field.

#### Technical Societies Cooperate

The Metal Exposition is held in conjunction with the National Metal Congress, and will supplement and serve to illustrate the technical programs held by the American Society for Metals, the Iron and Steel Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers, the American Welding Society, the American Society of Mechanical Engineers, and the Wire Association.

A list of firms that have reserved exhibit space, along with a brief indication of what they will have to show the metal world, is given on page 8.

#### Show Open Daily

Hours of the Exposition, which is held under the auspices of the American Society for Metals and is directed by W. H. Eisenman, secretary, are as follows:

Monday, Oct. 18	12 noon to 10 p.m.
Tuesday, Oct. 19	12 noon to 10 p.m.
Wednesday, Oct. 20	12 noon to 10 p.m.
Thursday, Oct. 21	12 noon to 6 p.m.
Friday, Oct. 22	9:30 a.m. to 10 p.m.

All members of the five cooperating societies and also members of other technical societies will be permitted to register for the Exposition upon presentation of their membership cards. Registration is free and provides admission to the Exposition for the week of its duration.

A number of engraved invitations is also being distributed by the exhibiting firms, but no free tickets will be available.

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# THE REVIEW

Published monthly except July and September by the  
**American Society for Metals**  
 7016 Euclid Ave., Cleveland, O.

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Subscriptions fifty cents a year; five cents a copy. Entered as Second Class Matter, July 26, 1930, at the Post Office at Cleveland, Ohio, under the Act of March 3, 1879.

RAY T. BAYLESS.....*Editor*  
 M. R. HYSLOP.....*Managing Editor*

Cleveland, O., October, 1937  
 Volume X No. 8

## A. S. M. to Pioneer Discussion Groups At Metal Congress

A new idea will be sponsored by the American Society for Metals at the National Metal Congress in the form of discussion groups.

These discussions will take place following each of the three lectures in the course to be presented by J. R. Vilella on "Metallographic Technique." The lectures will be held Monday, Tuesday, and Wednesday, Oct. 18, 19 and 20 at 8:00 p.m.

Since metallographic technique is a live subject, and since these Metal Congress lecture courses have proven extremely popular in the past few years, a considerable amount of discussion should follow each lecture. Large groups, however, are not conducive to the free exchange of ideas and experiences.

A plan has therefore been devised whereby the lecture will be followed by a 15-minute question period handled by Mr. Vilella, and the group then broken up into small units of 12 or 15 persons for another 30 or 40-minute period. These groups will be divided arbitrarily and each will have a discussion group leader who has been carefully selected by the Educational Lecture Committee of the Society, and instructed in the proper method of leading the discussion.

## Thirteen Papers Are on Carburizing Symposium

Carburizing will be the timely and practical subject of a symposium to be held by the American Society for Metals during the National Metal Congress in Atlantic City.

The symposium will occupy two days of the week-long Congress—namely, Thursday and Friday, Oct. 21 and 22, meeting simultaneously with other general technical sessions.

The symposium will open Thursday morning with papers of an introductory nature by Grossmann, McQuaid, and Williams. More detailed discussions in the afternoon will cover the subjects of selection of type of case, decarburization, steels for carburizing, and a hardenability test.

Friday's papers will be of a more practical character, on production carburizing, carburizing containers, carburizing compounds, commercial gas carburizing, light cases, and liquid baths.

## A. S. M. Headquarters at Congress



The Ambassador Hotel, Boardwalk at Brighton Ave., Atlantic City, N. J., is Headquarters for the A.S.M. and the Wire Association During the National Metal Congress. William Hamilton, who has an enviable world reputation as a "host," is manager of the Ambassador and Harold E. Baggs is the capable convention manager of the Hotel.



William Hamilton



Harold E. Baggs  
 Photos by Coleman

## President's Reception on Sunday Begins A. W. S. Activities at Metal Congress

Activities of the American Welding Society during the National Metal Congress in Atlantic City start on Sunday afternoon, Oct. 17, the day before the official opening of the Congress, with an informal president's reception to members and guests.

Headquarters for the Welding Society are at Hotel Traymore.

A business session on Monday morning includes a report by the president, special reports on research and technical committee activities, award of the Samuel Wylie Miller Memorial Medal and the Lincoln Gold Medal. Technical sessions start on Monday afternoon with a variety of interesting papers on industrial research problems.

### Fundamental Research Sessions

All day Tuesday, Oct. 19, is given over to papers dealing with fundamental researches in welding as conducted in the various universities of the United States. On Tuesday afternoon there is also a joint meeting with the American Society of Mechanical Engineers.

Tuesday evening is devoted to a research conference of those interested in fundamental research in welding.

The session on Wednesday morning deals with fabrication in a variety of fields.

Practical applications are covered in the Thursday and Friday sessions. A symposium on alloy steels Thursday morning is followed in the afternoon by four important shipbuilding papers.

The railroad session on Friday is

### Metal Treating Institute Meets

The annual meeting of the Metal Treating Institute will be held Monday, Oct. 18, at 10:00 a.m. at the Hotel Ambassador, Atlantic City, N. J., during the week of the National Metal Congress and Exposition.

The Metal Treating Institute is an organization of commercial steel treaters.

expected to draw a large attendance.

An interesting program for the ladies in attendance is being planned, including luncheon, card party, trip around island and tea. Opportunities for recreation are also provided.

The general Convention Program Committee is headed by C. A. McCune, the technical program by E. F. David, and local section cooperation by T. M. Jackson of Philadelphia and J. W. Miller, Maryland.

The annual meeting of the American Welding Society provides an unusual opportunity to interchange ideas or ask questions about welding problems, with hundreds of leading welding experts present. A complete program of activities is printed on page 6.

## A. S. M. E. Session On Welding Design

The American Society of Mechanical Engineers will cooperate with the American Welding Society in sponsoring a meeting on Tuesday, Oct. 19, during the National Metal Congress.

This session will feature the mechanics of welding and the relation of design to welding. Three papers will be presented, the first by J. M. Cooper of General Electric Co. on "Resistance Welding Fabrication," the second by C. C. Brinton of Westinghouse Electric & Mfg. Co. on "Developments in Large Welded Structures," and the third by C. W. Obert of New York on "Recent Developments in Fusion Welding."

The Machine Shop Practice Division of the A.S.M.E. will also sponsor a dinner on Wednesday, Oct. 20, jointly with the Institute of Metals and Iron and Steel Divisions of the A.I.M.E. The dinner will be held at 7:00 p.m. in the main dining-room of the Ritz-Carlton Hotel. Harvey N. Davis, president of Stevens Institute of Technology, will speak on "The Place of the Engineer in Modern Life."

## A. I. M. E. Sponsors Set of Meetings On Physics of Metals

Round Table, Technical Session and Science Lecture to Be on This Subject

A sequence of meetings devoted to physics of metals will start off the technical program of the American Institute of Mining and Metallurgical Engineers at the National Metal Congress in Atlantic City, Oct. 18 to 22.

Headquarters for the A.I.M.E. Institute of Metals and Iron and Steel Divisions will be at the Ritz-Carlton Hotel, where registration, technical sessions, Science Lecture, Metals Divisions dinners, and all committee meetings will be held.

The opening meeting, however, will be at the Auditorium on Monday, Oct. 18, at 8:00 p.m., and will consist of a Round Table Discussion on Physics of Metals, sponsored jointly by the A.I.M.E. Metals Divisions, the American Society for Metals, the American Society for Testing Materials, and the American Institute of Physics.

### Science Lecture Tuesday P.M.

The technical session on Tuesday morning and the Science Lecture on Tuesday afternoon will also be devoted to this subject. Prof. Arthur F. Benton of the University of Virginia will be the Science Lecturer, and his subject is "The Behavior of Gases at Metal Surfaces."

Other technical sessions, as designated in the detailed program on page 6, will be devoted to general metallurgy, metallography, and open-hearth steel practice.

Luncheon meetings are as follows: Executive Committee of the Iron and Steel Division on Wednesday, Oct. 20; Executive Committee of the Institute of Metals Division on Thursday, Oct. 21; and Open-Hearth Executive Committee on Thursday, Oct. 21.

A dinner will be held on Wednesday, Oct. 20, jointly with the A.S.M.E. Speaker will be Harvey N. Davis, president of Stevens Institute of Technology.

Members and visitors are cordially invited to come to the A.I.M.E. booth in the Metal Exposition, rest, converse with friends, and enjoy moving pictures that will present phases of the mineral industries that are complementary to the daily activities of the metallurgists.

## Atlantic City Provides Unique Program of Events For Ladies Entertainment

A roller chair ride will be something different from what is usually offered in the way of entertainment for the ladies attending the National Metal Congress and Exposition.

Held for the first time in Atlantic City, the week of Oct. 18, the Congress will provide many other activities of varied and unusual interest.

A registration desk will be provided at the Ambassador Hotel for the ladies who wish to attend these events. A fee of \$2.50 will be charged to cover partially the expenses of these activities.

The complete program is as follows:  
 Monday, Oct. 18—Luncheon and style show at the Ambassador Hotel.

Tuesday, Oct. 19—Motor trip and tea at the Country Club.

Wednesday, Oct. 20—Card party at Stratosphere Room, Traymore Hotel; entertainment by fortune teller and snip-snip artist; tea.

Thursday, Oct. 21—Roller chair ride and visit to the net haul.



## Metallography Is Subject of Evening Course

**J. R. Vilella's Three Lectures on Metallographic Technique Will Be Directed Toward Practical Considerations**

Directed toward practical considerations, a series of three lectures on "Metallographic Technique" to be presented by J. R. Vilella, Research Laboratories, United States Steel Corp., at the National Metal Congress should prove to be a source of instruction as well as an opportunity for the exchange of ideas on the latest metallographic methods.

This lecture course will be held Monday, Tuesday, and Wednesday, Oct. 18, 19, and 20, at 8:00 p.m. in the Ballroom of the Auditorium at Atlantic City. It is open to anyone attending the Congress.

### Discussions to Follow Lectures

The first lecture will be devoted to the selection, removal, and preparation of samples for metallographic examination. Mr. Vilella will discuss all of the various methods of grinding and polishing, and will exhibit samples of various polishing cloths and powders.

The second lecture will be devoted to etching, while the third will be concerned with the manipulation of the microscope and the preparation of photomicrographs.

Each lecture will be followed by a discussion period, at which time a new plan will be inaugurated for handling discussion of technical subjects. Immediately after Mr. Vilella's lecture is finished, there will be a 15-minute period for direct questions to be answered by Mr. Vilella. The audience will then be arbitrarily divided into groups of ten to 15 persons each, and a specially appointed discussion group leader will be placed in charge of each of these groups.

### Originates Metallographic Methods

Among Mr. Vilella's contributions to metallographic technique are a method of polishing steel without pitting out non-metallic inclusions; polishing and etching methods for iron-chromium alloys, aluminum and its alloys, copper and its alloys, and lead and its alloys; and the discovery of a reagent for revealing the case in nitrided steel.

His early work, after graduating from Pennsylvania State College with a degree of bachelor of science in chemistry, was in physiological and pathological research at the Psychiatric Institute, Morristown, N. J. His microscopic studies, however, turned to metals when he came with Union Carbide & Carbon Research Laboratories in 1923. Several years ago he joined the United States Steel Corp. Research Laboratories.

## Golf Clubs Will Be Open To Metal Congress Visitors

The following golf clubs of Atlantic City extend the courtesies of their golf courses to visitors to the National Metal Congress and Exposition the week of Oct. 18. Green fees must be paid at the clubs.

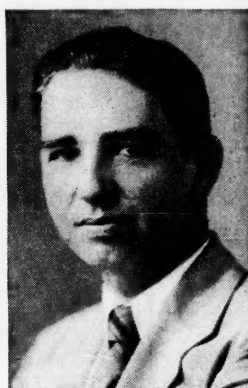
Country Club of Atlantic City  
Linwood Country Club  
Seaview Golf Club

Taxis will have a special rate of one to five persons of \$2.00 each way to the Country Club of Atlantic City, or \$2.50 each way to the Seaview or Linwood.

## Three Lecturers at Metal Congress



J. R. Vilella



W. P. Sykes



Earnshaw Cook

J. R. Vilella will present an Educational Course on "Metallographic Technique" on Monday, Tuesday, and Wednesday, Oct. 18, 19 and 20, at 8:00 p.m. W. P. Sykes will present the Campbell Memorial Lecture to the A.S.M. Wednesday morning, Oct. 20. Earnshaw Cook will deliver five lectures on "Open-Hearth Steel Making" each day of the Congress at 4:30 p.m.

## Informal Discussions On Wire Program

Every wire mill executive engaged in the manufacture or fabrication of wire and wire products of any kind should derive considerable profit from attending the meetings of the Wire Association during the National Metal Congress in Atlantic City Oct. 18 to 22.

Informal discussions will form an important part of the program. These discussions will be held at the Wire Association headquarters in the Ambassador Hotel from 9:00 a.m. to 11:00 p.m. daily.

Technical sessions will be held from Monday through Thursday with simultaneous meetings of the Ferrous and Non-Ferrous Divisions on Wednesday, Oct. 20.

The first morning of the Congress will be devoted to registration and "get together," with a directors' meeting and Program Committee meeting and luncheon at 1:00 p.m. The annual dinner and stag smoker will be held Wednesday at 7:30 p.m. at the Ambassador Hotel.

Stenographic copies of the discussions will be available, free to all those registering and attending the meetings. Those who do not register for the meetings may have copies of the discussions for \$5.00 per copy.

## Alumni Luncheons Are to Follow Campbell Lecture

Carnegie Institute of Technology, Case School of Applied Science, Lehigh University, Massachusetts Institute of Technology, University of Michigan, and University of Missouri School of Mines and Metallurgy will sponsor alumni luncheons during the National Metal Congress in Atlantic City.

These luncheons will be held in the Ambassador Hotel, Wednesday, Oct. 20, immediately following the Annual Meeting and Campbell Memorial Lecture of the American Society for Metals. The rooms in which they are to be held will be announced on the bulletin board in the hotel lobby.

Registrations will be taken Monday, Tuesday, and Wednesday, Oct. 18, 19 and 20, at the A.S.M. registration desk in the hotel. Price will be \$1.00 per person.

All former students and faculty members of the universities listed, now engaged in the metallurgical industries, are cordially invited to attend these luncheons.

## Sykes Honored as Campbell Lecturer

**Presentation to Follow A. S. M. Annual Meeting Oct. 20**

One of the highest honors conferred by the American Society for Metals on a member is the privilege of presenting the Edward de Mille Campbell Memorial Lecture during the annual convention of the Society and National Metal Congress.

Chosen for Campbell lecturer this year at the Congress in Atlantic City is Wesley Pope Sykes, metallurgical engineer, Cleveland Wire Works, General Electric Co.

The Campbell lecture will be presented Wednesday morning, Oct. 20, in the Renaissance Room of the Ambassador Hotel immediately following the annual meeting of the A.S.M.

Young (only 44), "Bill" Sykes has nevertheless already contributed much to technical knowledge and literature, and was awarded the Howe Medal of the A.S.M. in 1927 for the best paper which appeared in TRANSACTIONS for that year.

Most of Mr. Sykes' work has been with tungsten and molybdenum wires and the development of metals and alloys used in incandescent lamp making. The subject of his lecture has not yet been announced.

## Dioramas of Iron Smelting Shown at A. S. M. Booth

The *Stückofen*, or iron smelting furnace of the Middle Ages, will be depicted in action at the exhibit of the American Society for Metals at the National Metal Exposition.

An animated diorama will show the preparation of the ore and lime, the charging of the furnace, and the horse-driven bellows. This will supplement the first diorama showing an even earlier iron smelting furnace, which will also be on display at the booth.

By adding a new subject each year it is planned to have eventually a unified series of historical exhibits depicting early processes in metal melting and fabrication.

The American Society for Metals and METAL PROGRESS will occupy Booth D-39 at the Metal Show. Members of A.S.M. chapters, who are acting as hosts to the Metal Congress, will be on hand each day to welcome visitors and help them with information regarding activities at the Show. Some of those who will be in attendance are listed on page 9.

## Cook Presents Course on O. H. Steel Making

**Series of Five Lectures Will Be Presented Each Day During Congress at 4:30**

"Open-Hearth Steel Making" is the subject of an educational course of five lectures which is to be presented by Earnshaw Cook, research metallurgist, American Brake Shoe and Foundry Co., during the National Metal Congress in Atlantic City.

The lectures will be presented each day during the Congress (Monday through Friday, Oct. 18 to 22) at 4:30 p.m. in the Ballroom of the Auditorium.

The course is offered without cost to members of the American Society for Metals in good standing, and registrations will be taken at the Ambassador Hotel and the Auditorium until noon on Monday, Oct. 19.

Registration is made on presentation of A.S.M. membership cards. Members not wishing to attend all lectures may enroll for individual lectures.

### Subjects of Lectures

The course will be handled in a direct and forceful way which should appeal to operating men as well as to laboratory men and students. The subjects of the five lectures are as follows:

1. History and Equipment (illustrated by moving pictures supplied by the Carnegie-Illinois Steel Corp.).
2. Furnace Practice.
3. Temperature Control and Pit Practice.
4. The Open-Hearth Steel Ingot.
5. Production Metallurgy (including metallurgical plant control).

An opportunity for discussion will be provided after each of the lectures. In order to derive the greatest possible value from this period, other experts in various branches of open-hearth practice have been invited to assist Mr. Cook in handling the discussion and answering some of the questions.

### Cook Has Wide Experience

Mr. Cook's experience with open-hearth steel manufacture has been varied and complete, covering both the operating and supervising ends. A graduate of Princeton in 1921 and of Massachusetts Institute of Technology in 1922, he has been consecutively assistant superintendent of the Saucon open hearth of Bethlehem Steel Co., assistant chief mill inspector for Bethlehem's Lehigh plant, assistant engineer of tests in the Maryland plant and metallurgist in the Maryland plant. He has been research metallurgist for American Brake Shoe and Foundry Co. since 1934.

## Canadian Luncheon Will Be Held Tuesday, Oct. 19

The second annual Canadian Luncheon of the American Society for Metals will consist in an informal get-together sponsored by the members of the Montreal and Ontario Chapters during the National Metal Congress in Atlantic City.

It will be held Tuesday, Oct. 19, at 12:30 in the Surf Room of the Ambassador Hotel. Price for the luncheon will be \$1.00 per person. Reservations will be taken at the A.S.M. registration desk in the Ambassador Hotel on Monday and Tuesday, Oct. 18 and 19.

An invitation to attend is extended to all who may be interested. The luncheon is planned to afford an opportunity for former and present Canadians and their friends to renew old acquaintances and make new ones.

## Many Services Provided for Guests at Expo

**Only Those Wearing Official Badges Denoting Congress Registrations Are Entitled to Special Privileges**

The special courtesies and privileges mentioned herein are provided for the exclusive use of the members and guests of the National Metal Congress and National Metal Exposition.

**THE OFFICIAL BADGE MUST BE WORN** to entitle you to these privileges.

### Post Office

United States mail addressed care of National Metal Congress, Secretary's Office, Atlantic City Auditorium, Atlantic City, N. J., will be distributed to exhibitors' booths. Members are requested not to send circular matter for distribution to other exhibitors.

### Telephones and Telegraph

A telephone switchboard will be in operation at the Auditorium on a 24-hr. basis throughout the Convention. All convention telephones, including those in exhibitors' booths, will be tied into this switchboard. The phone number is 4-7181.

Public telephone and telegraph services are provided in the outer corridors of the Auditorium, to the right and left, upon entering. Operators will be on hand to render service.

### Transportation

Taxicab rates are 50c for one or two persons for a continuous trip to any point within the city limits; 10c for each additional passenger.

Comfortable and speedy jitney automobiles operate the entire length of Pacific Ave. (at the rear of the Auditorium) which parallels the Boardwalk. The fare is 10c per person. For an additional 10c the jitney will turn off Pacific Ave. and deliver passengers to the Boardwalk.

### Rolling Chairs

Persons with convention badges will be entitled to a special rate for the rolling chairs on the Boardwalk. Between the Seaside Hotel and the Auditorium or between Hotel Chelsea and the Auditorium in either direction the charge will be 50c for one, two, or three passengers. This rate is for a direct trip to and from the Auditorium only. This special rate applies only on chairs of the Shill Rolling Chair Co.

### Auditorium Garage Service

A large, fireproof garage is located in the basement of the Auditorium with entrance on Georgia Ave. Rates are 50c per day, 75c per 24-hr., or \$4.00 for the duration of the Convention.

### Official Photographer

Fred Hess & Son, 166 S. Virginia Ave., Atlantic City, has been appointed official photographer. Special rates are extended to those attending the Congress and Exposition. The company will have a desk in the Auditorium for receiving orders.

### Information and Mail

General information can be obtained at the Registration Desk in the entrance lobby. All mail addressed in care of the Convention and not delivered to a booth will be held at the Registration Desk.

Any information re public conveyances (bus or trolleys) will be furnished at the Registration Desk, and a Lost and Found service will also be maintained.

## To Act as Hosts at Metal Congress



W. H. Swanger



W. E. Harvey



A. F. Whalen

Photographs by "W.G.P." Bill Coleman



L. S. Bergen



C. S. Cronkright



C. H. Stoeckle



P. S. Lane

Chairmen of seven eastern chapters of the American Society for Metals have been appointed by President Bain to act as hosts to the National Metal Congress in Atlantic City the week of Oct. 18. The Committee is as follows:

L. S. Bergen, chairman, New York Chapter, Crucible Steel Co. of America, New York City.

Wilbur E. Harvey, chairman, Lehigh Valley Chapter, Catasauqua, Pa.

A. Floyd Whalen, chairman, York Chapter, 610 East 16th St., Harrisburg, Pa.

W. H. Swanger, chairman, Washington Chapter, U. S. Bureau of Standards, Washington, D. C.

C. S. Cronkright, chairman, New Jersey Chapter, Public Service Corp., Newark, N. J.

Charles H. Stoeckle, chairman, Philadelphia Chapter, Crucible Steel Co. of America, Philadelphia.

Paul Lane, chairman, Baltimore Chapter, American Hammered Piston Ring Co., Baltimore, Md.

Representatives of the Committee will be stationed at the A.S.M. booth (D-39), National Metal Exposition and at the Ambassador Hotel, A.S.M. headquarters for the Congress. These chairmen will be equipped with badges and will be glad to be of any service possible to out-of-town guests.

## A. S. M. Annual Banquet Is Scheduled for Thursday

Second of the two yearly opportunities for A.S.M. members to gather in one place for participation in Society business is the Annual Banquet of the American Society for Metals.

Following closely the Annual Meeting of the Society on Wednesday, Oct. 20, the Banquet will be held Thursday, Oct. 21, in the Renaissance Room, Ambassador Hotel, Atlantic City, during the week of the National Metal Congress and Exposition.

A speaker of national prominence in the metal industry will give the principal address at the Banquet.

Other features will be the award of the Albert Sauveur Achievement Medal to someone whose early metallurgical work has stimulated further achievements along similar lines, the award of the Henry Marion Howe Medal to the author of the paper appearing in TRANSACTIONS of the A.S.M. during the past year judged to be the best, and the award of the Past President's Medal.

Tickets for the Banquet will be \$4.00 and may be secured at the Ambassador or Auditorium headquarters. Advance reservations should be sent to the American Society for Metals, 7016 Euclid Ave., Cleveland. Tables will seat eight.

## Metal Progress for October Will Be Reference Number

**Will Contain 318 Pages, 30 Data Sheets, Ten Sections**

Rolling off the presses in about a week will come the Annual Reference Number of METAL PROGRESS, monthly magazine of the American Society for Metals.

Containing over 300 pages all told, 30 of which will be data sheets carrying valuable reference material, this October issue is designed to coincide with and supplement the National Metal Congress and Exposition to be held in Atlantic City, Oct. 18 to 22.

The magazine will be divided into ten sections covering the following subdivisions in the field of metals:

- Heat Treating
- Furnaces and Refractories
- Pressing and Forging Operations
- Carbon Steel, Sheet, Bar and Cold Drawn
- Alloy and Tool Steels
- Testing and Control Instruments
- Heat and Corrosion Resisting Metals
- Welding and Cutting
- Non-Ferrous Metals
- Stainless Steels

Most of the articles will be of a review nature with each section supplemented by reference data sheets; thus making a book that will be of permanent value.

Assembled by Editor Ernest E. Thum with the cooperation and contributions of many A.S.M. members, this wealth of editorial material is an effort of the Society to be of greater service to its ten thousand members!

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### American Society for Metals

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# Daily Programs of Five Societies During Congress

Papers to Be Presented by American Society for Metals, American Welding Society, American Institute of Mining and Metallurgical Engineers, Wire Association, and American Society of Mechanical Engineers at National Metal Congress, Atlantic City, October 18 to 22.

## American Society for Metals

MONDAY, OCT. 18

10:00 a.m.—Renaissance Room, Ambassador Hotel  
THE PROCESS OF DRY CYANIDING, by R. J. Cowan and J. T. Bryce, Surface Combustion Corp.

THE MECHANISM OF STEEL HARDENING AND TEMPERING AS INDICATED BY COERCIVE FORCE MEASUREMENTS, by R. S. Dean, U. S. Bureau of Mines, and C. Y. Clayton, Missouri School of Mines and Metallurgy.

EFFECT OF TEMPERING QUENCHED HYPER-EUTECTOID STEELS ON THE PHYSICAL PROPERTIES AND MICROSTRUCTURE, by C. R. Austin and R. S. Norris, Pennsylvania State College.

2:00 p.m.—Ballroom, Auditorium  
EFFECT OF CARBON ON THE HARDENABILITY OF HIGH PURITY IRON-CARBON ALLOYS, by T. G. Digges, National Bureau of Standards.

PRECIPITATION HARDENING OF COBALT STEELS; A NEW MATERIAL, by R. H. Harrington, General Electric Co.

QUANTITATIVE HARDENABILITY, by J. L. Burns, T. L. Moore and R. S. Archer, Republic Steel Corp.

2:00 p.m.—Room B, Auditorium  
Simultaneous Session

A NOTE ON RAPID PHOTOMICROGRAPHY, by W. Mutchler and H. O. Willier, National Bureau of Standards.

THE EFFECT OF GRAIN SIZE ON THE OXIDATION OF A LOW CARBON STEEL, by C. A. Siebert and Clair Upthegrove, University of Michigan.

ELECTROMAGNETIC MEASUREMENTS AND STEEL STRUCTURES, by Carl Kinsley, Consulting Engineer.

4:30 p.m.—Ballroom, Auditorium  
Educational Lecture on OPEN-HEARTH STEEL MAKING, by Earnshaw Cook, American Brake Shoe and Foundry Co.

8:00 p.m.—Ballroom, Auditorium  
Educational Lecture on METALLOGRAPHIC TECHNIQUE, by J. R. Vilella, Union Carbide & Carbon Corp.

8:00 p.m.—Room B, Auditorium  
Round Table Discussion on PHYSICS OF METALS, sponsored jointly by A.I.M.E. Metals Division, A.S.M., A.S.T.M., and American Institute of Physics.

## Renaissance Room, Ambassador



Most of the Technical Sessions, the Carburizing Symposium, and the Annual Meeting of the A.S.M. Will Be Held in the Beautiful Renaissance Room of the Ambassador Hotel, Atlantic City

TUESDAY, OCT. 19

10:00 a.m.—Renaissance Room, Ambassador Hotel

THE RUPTURE STRENGTH OF STEELS AT ELEVATED TEMPERATURES, by A. E. White and C. L. Clark, University of Michigan, and R. L. Wilson, Timken Roller Bearing Co.

THE ELECTRODE SALT BATH FOR HARDENING HIGH SPEED STEEL, by Axel Hultgren, Consulting Engineer.

A NEW APPLICATION FOR THE SHORT-TIME HIGH TEMPERATURE TENSILE TEST, by C. L. Clark, A. E. White and C. J. Guarnieri, University of Michigan.

12:30 p.m.—Surf Room, Ambassador Hotel  
Canadian Luncheon

2:00 p.m.—Ballroom, Auditorium  
AUSTENITIC GRAIN SIZE OF EUTECTOID STEEL, by Harry Tobin and R. L. Kenyon, American Rolling Mill Co.

SOME FACTORS INFLUENCING AUSTENITE GRAIN SIZE IN HIGH PURITY STEELS, by G. Derge, Carnegie Institute of Technology, A. R. Kommel, United Engineering & Foundry Co., and R. F. Mehl, Carnegie Institute of Technology.

RELATION OF PRE-TREATMENT OF STEELS TO AUSTENITE GRAIN GROWTH, by J. E. Dorn and O. E. Harder, Battelle Memorial Institute.

4:30 p.m.—Ballroom, Auditorium  
Educational Lecture on OPEN-HEARTH STEEL MAKING, by Earnshaw Cook.

8:00 p.m.—Ballroom, Auditorium  
Educational Lecture on METALLOGRAPHIC TECHNIQUE, by J. R. Vilella.

WEDNESDAY, OCT. 20

10:00 a.m.—Renaissance Room, Ambassador Hotel  
Annual Meeting of the American Society for Metals

EDWARD DE MILLE CAMPBELL MEMORIAL LECTURE, by W. P. Sykes, Cleveland Wire Works, General Electric Co.

12:30 p.m.—Ambassador Hotel  
Alumni Luncheons

2:00 p.m.—Ballroom, Auditorium

THE EFFECT OF MASS UPON THE MECHANICAL PROPERTIES OF CAST STEEL, by C. W. Briggs and R. A. Gezelius, U. S. Naval Research Laboratories.

THE FATIGUE RESISTANCE OF STEEL AS AFFECTED BY SOME CLEANING METHODS, by J. H. Frye, Jr. and G. L. Kehl, Lehigh University.

INFLUENCE OF HEAT TREATMENT ON CREEP OF CARBON-MOLYBDENUM AND CHROMIUM-MOLYBDENUM-SILICON STEEL, by R. F. Miller, R. F. Campbell, and R. H. Aborn, United States Steel Corp. Research Laboratories, and E. C. Wright, National Tube Co.

4:30 p.m.—Ballroom, Auditorium  
Educational Lecture on OPEN-HEARTH STEEL MAKING, by Earnshaw Cook.

8:00 p.m.—Ballroom, Auditorium  
Educational Lecture on METALLOGRAPHIC TECHNIQUE, by J. R. Vilella.

THURSDAY, OCT. 21

10:00 a.m.—Rainbow Room, Ambassador Hotel  
THE INITIAL STAGES OF GRAPHITIZATION, by H. A. Schwartz and M. K. Barnett, National Malleable and Steel Castings Co.

AN X-RAY STUDY OF THE AR<sub>2</sub> AND AC POINTS OF IRON AND IRON-NICKEL ALLOYS, by Sidney D. Smith, Pennsylvania State College.

GRAPHITIZATION IN HIGH PURITY IRON-CARBON ALLOYS, by Cyril Wells, Carnegie Institute of Technology.

10:00 a.m.—Renaissance Room, Ambassador Hotel  
Symposium on Carburizing

A REVIEW OF SOME FUNDAMENTALS OF CARBURIZING, by M. A. Grossmann, Carnegie-Illinois Steel Corp.

A THEORETICAL DISCUSSION OF THE ACTION OF SOLID CARBURIZING AGENTS, by H. W. McQuaid, Republic Steel Corp.

GASEOUS MEDIA FOR CARBURIZING, by Gordon T. Williams, Cleveland Tractor Co.

2:00 p.m.—Room B, Auditorium  
SOLUBILITY OF COPPER IN THE GRAIN-BOUNDARY MATERIAL OF A SOLID SOLUTION OF COPPER IN ZINC, by G. R. Dean, Miner Laboratories, and W. P. Davey, Pennsylvania State College.

THE RATE OF AUSTENITE TRANSFORMATION IN CAST IRON, by D. W. Murphy, W. P. Wood and D. Girardi, University of Michigan.

THE EFFECTS OF COLUMBIUM AND OTHER ADDITION AGENTS ON LOW CHROMIUM STEELS, by Russell Franks, Union Carbide and Carbon Research Laboratories.

2:00 p.m.—Ballroom, Auditorium  
Symposium on Carburizing

FACTORS GOVERNING SELECTION OF TYPE OF CARBURIZED CASE, by A. L. Boegehold and C. J. Tobin, General Motors Research Laboratories.

FURNACE ATMOSPHERES AND DECARBURIZATION, by J. A. Webber, Interstate Drop Forge Co.

STEELS USED IN THE CARBURIZING PROCESS, by O. W. McMullan, Youngstown Sheet and Tube Co.

A HARDENABILITY TEST FOR CARBURIZING STEEL, by W. E. Jominy and A. L. Boegehold, General Motors Research Laboratories.

4:30 p.m.—Ballroom, Auditorium  
Educational Lecture on OPEN-HEARTH STEEL MAKING, by Earnshaw Cook.

7:00 p.m.—Renaissance Room, Ambassador Hotel  
Annual Banquet of American Society for Metals

FRIDAY, OCT. 22

10:00 a.m.—Room B, Auditorium

EFFECTS OF LONGITUDINAL SCRATCHES ON VALVE SPRING WIRE, by F. P. Zimmerli, Barnes-Gibson-Raymond, Inc., W. P. Wood, University of Michigan, and G. D. Wilson, Barnes-Gibson-Raymond, Inc.

RECOVERY OF COLD-WORKED NICKEL ON ANNEALING, by Erich Fetz, Wilbur B. Driver Co.

METAL COLORING, by C. B. F. Young, Columbia University.

10:00 a.m.—Ballroom, Auditorium  
Symposium on Carburizing

PRODUCTION CARBURIZING, by E. F. Davis, Warner Gear Division, Borg-Warner Corp.

A STUDY OF COMMERCIAL CARBURIZING CONTAINERS, by R. W. Roush and A. C. Dames, Timken-Detroit Axle Co.

THE PHYSICAL AND CHEMICAL CHARACTERISTICS OF CARBURIZING COMPOUNDS AND THEIR HANDLING IN PRODUCTION, by S. L. Widrig, Spicer Mfg. Co.

2:00 p.m.—Room B, Auditorium

A STUDY OF DEOXIDATION TYPE INCLUSIONS IN ALLOY STEELS, by W. A. Hare and Gilbert Soler, Timken Roller Bearing Co.

SOME PROBLEMS IN THE PRODUCTION OF LOW CARBON SHEETS IN NON-CONTINUOUS MILLS, by M. L. Samuels and Alfred Boyles, Battelle Memorial Institute.

# Daily Programs of Five Societies During Congress

## American Society for Metals

(Continued from page 5)

RELATION OF SIZE OF SPHEROIDS IN TOOL STEEL TO ITS MACHINABILITY AND TO HOLDING EDGE OF CUTTER, by D. E. Roda, International Business Machines Corp.

2:00 p.m.—Ballroom, Auditorium  
*Symposium on Carburizing*

COMMERCIAL GAS CARBURIZING, by L. D. Gable and E. S. Rowland, Timken Roller Bearing Co.

LIGHT CASES BY GAS CARBURIZING, by V. T. Malcolm, Chapman Valve Co.

LIQUID BATH CARBURIZING, by B. B. Beckwith, Chrysler Corp.

4:30 p.m.—Ballroom, Auditorium

Educational Lecture on OPEN-HEARTH STEEL MAKING, by Earnshaw Cook.

## American Welding Society

The Session on Tuesday Afternoon is Held Jointly with  
American Society of Mechanical Engineers

SUNDAY, OCT. 17

5:00 to 7:00 p.m.—Stratosphere Room, Hotel Traymore  
*Bird's-eye View of Boardwalk and Island*

*Informal President's Reception to members and their ladies*

MONDAY, OCT. 18

9:30 a.m.—Hotel Traymore  
*Opening and Business Sessions*

2:00 p.m.—Hotel Traymore  
*Industrial Research*

Chairman—G. F. Jenks, Ordnance Department, U.S. Army.

Vice-Chairman—E. Vom Steeg, General Electric Co.

WELDABILITY OF LOW ALLOY STEELS, by W. L. Warner, Watertown Arsenal  
THE SPOT WELDING CHARACTERISTICS OF SOME COPPER-BASE ALLOYS, by D. K. Crampton and J. J. Vreeland, Chase Brass & Copper Co.

SURVEY OF LOW ALLOY STEELS AS TO WELDABILITY, by J. H. Critchett, Union Carbide & Carbon Research Laboratories.

PHYSICAL PROPERTIES AND CORROSION RESISTANCE OF NICKEL-IRON ALLOYS FORMED IN THE WELDING OF NICKEL-CLAD STEEL, by J. H. Deppeler, W. G. Thiesinger and F. G. Flocke.

X-RAY METHODS OF STUDYING STRESS RELIEF IN WELDS, by J. T. Norton, Massachusetts Institute of Technology.

6:00 p.m.—Hotel Traymore  
*Board of Directors' Meeting*

TUESDAY, OCT. 19

9:30 a.m.—Hotel Traymore  
*Fundamental Research in Welding*

Chairman—Everett Chapman, Lukenweld, Inc.

Vice-Chairman—Otto H. Henry, Polytechnic Institute of Brooklyn.

FATIGUE TESTS OF BUTT WELDS IN PLATES, by W. M. Wilson, University of Illinois.

PROXIMITY EFFECT IN WELDING PROBLEMS, by E. Bennett, University of Wisconsin.

THE HEAT EFFECT IN WELDING, by W. H. Bruckner, U. S. Naval Research Laboratory.

2:00 p.m.—Hotel Traymore  
*Fundamental Research in Welding*

Chairman—T. M. Jackson, Sun Shipbuilding & Dry Dock Co.

Vice-Chairman—J. H. Zimmerman, The Linde Air Products Co.

WELDED GIRDERS WITH INCLINED STIFFENERS, by Cyril D. Jensen, Lehigh University.

WELDING OF COPPER, by A. P. Young, Michigan College of Mining and Technology.

STATIC AND IMPACT TENSILE PROPERTIES OF STAINLESS STEEL WELDS AT ORDINARY AND LOW TEMPERATURES, by O. H. Henry, Polytechnic Institute of Brooklyn.

EFFECT OF WELDED CLIP ANGLES ON BEAM-COLUMN CONNECTIONS, by Inge Lyse, Lehigh University.

HIGH SPEED MOTION PICTURES OF FLAME CUTTING, by H. R. Bullock, Massachusetts Institute of Technology.

2:00 p.m.—Hotel Traymore

*Joint Session With American Society of Mechanical Engineers*

RESISTANCE WELDING FABRICATION, by J. M. Cooper, General Electric Co.

DEVELOPMENTS IN LARGE WELDED STRUCTURES, by C. C. Brinton, Westinghouse Electric & Mfg. Co.

7:30 p.m.—Hotel Traymore  
*Conference and Meeting of Fundamental Research Committee*

WEDNESDAY, OCT. 20

9:30 a.m.—Hotel Traymore  
*Fabrication Session*

Chairman—H. C. Boardman, Chicago Bridge & Iron Works.

Vice-Chairman—E. V. David, Air Reduction Sales Co.

CARBON ARC WELDING IN AUTOMOTIVE WORK, by William Richards, Chevrolet Motor Co.

AUTOMATIC RESISTANCE WELDING, by Harry Landstrom, Nash-Kelvinator Corp.

WELDING—AN AID IN DAM CONSTRUCTION.

12:30 p.m.—Hotel Traymore

*Luncheon Conference of Executive Committees of Sections of Society*

THURSDAY, OCT. 21

9:30 a.m.—Hotel Traymore  
*Symposium on Alloy Steels*

Chairman—W. M. Mitchell, Carnegie-Illinois Steel Corp.

Vice-Chairman—Milton Male, U. S. Steel Corp.

LOW ALLOY STEELS, by G. S. Mikhlapov, Heintz Mfg. Co., and A. B. Kinzel, Union Carbide & Carbon Research Laboratories.

HIGH ALLOY STEELS, by J. C. Holmberg, Struthers-Wells-Titusville Corp., and R. Vincent, Alloy Fabricators.

2:00 p.m.—Hotel Traymore  
*Shipbuilding Session*

Chairman—Charles I. MacGuffie, General Electric Co.

Vice-Chairman—J. J. Crowe, Air Reduction Sales Co.

WELDING IN BUILDING TANKER VESSELS, by T. M. Jackson, Sun Shipbuilding & Dry Dock Co.

ASSEMBLY PLANT FOR THE WELDING OF BARGES, by George F. Wolfe, Dravo Corp.

PHASES OF TESTING IN THE WELDING OF NAVAL VESSELS, by W. P. Roop, U. S. Navy.

ALL-WELDED STEEL TANKERS, by A. C. Leigh, The Ingalls Iron Works Co.

7:00 p.m.—Hotel Traymore  
*Dinner Dance and Entertainment*

FRIDAY, OCT. 22

9:30 a.m.—Hotel Traymore  
*Railroad Session*

Chairman—P. G. Lang, Jr., Baltimore and Ohio Railroad Co.

Vice-Chairman—A. F. Davis, Lincoln Electric Co.

BUILDING UP LOCOMOTIVE DRIVING BOXES, by I. T. Bennett, Revere Copper & Brass, Inc.

MACHINE GAS CUTTING IN RAILROAD WORK, by H. Bass, New York Central Railroad.

WELDING OF RAILROAD ROLLING STOCK, by V. R. Willoughby, American Car and Foundry Co.

## American Institute of Mining and Metallurgical Engineers

Institute of Metals and Iron & Steel Divisions

MONDAY, OCT. 18

10:00 a.m. to 5:00 p.m.—Lounge, Third Floor, Ritz-Carlton Hotel  
*Registration*

8:00 p.m.—Room B, Auditorium  
*Round Table Discussion on Physics of Metals*  
(Sponsored jointly by A.I.M.E., A.S.M., A.S.T.M., and American Institute of Physics)

Chairman—L. W. McKeehan, Yale University.

TRUE STRESS-STRAIN CURVES FOR SINGLE CRYSTALS, S. L. Hoyt, A. O. Smith Corp., Discussion Leader.

TRUE STRESS-STRAIN CURVES FOR POLYCRYSTALLINE MATERIALS, R. K. Haskell, Watertown Arsenal, Discussion Leader.

INTERNAL DISSIPATION OF ENERGY IN METALS FOR SMALL CYCLIC STRAINS, R. L. Wegel, Bell Telephone Laboratories, Discussion Leader.

TUESDAY, OCT. 19

10:00 a.m.—Trellis Room, Ritz-Carlton Hotel  
*Physics of Metals*

A THEORY OF DIFFUSION IN SOLIDS, by John E. Dorn and Oscar E. Harder, Battelle Memorial Institute.

SOME FUNDAMENTALS CONCERNING IMPACT TESTING, by Earl B. Smith, College of the City of New York.

THE PROBLEM OF THE TEMPERATURE COEFFICIENT OF TENSILE CREEP RATE, by J. J. Kanter, Crane Co.

2:00 p.m.—Trellis Room, Ritz-Carlton Hotel  
*Science Lecture*

Chairmen—Albert J. Phillips, Institute of Metals Division, and Francis B. Foley, Iron and Steel Division.

BEHAVIOR OF GASES AT METAL SURFACES, by Arthur F. Benton, School of Chemistry, University of Virginia.



## A. I. M. E. Program—Continued

WEDNESDAY, OCT. 20

12:15 p.m.—Loggia Room, Ritz-Carlton Hotel  
Luncheon Meeting, Executive Committee, Iron and Steel Division

2:00 p.m.—Trellis Room, Ritz-Carlton Hotel  
DIFFUSION OF CARBON FROM STEEL INTO IRON, by L. C. Grimshaw, Duo Metals Division, Latrobe Electric Steel Co.

INVESTIGATIONS ON LEAD-MAGNESIUM ALLOYS FOR THE PREVENTION OF LEAD POISONING IN WATERFOWL, by R. L. Dowdell and R. G. Green, University of Minnesota.

THE EFFECT OF CHROMIUM ON THE GRAIN GROWTH OF BRASS, by Bruce W. Gonser and Carlos M. Heath, Battelle Memorial Institute.

7:00 p.m.—Main Dining-Room, Ritz-Carlton Hotel  
Dinner, Institute of Metals and Iron and Steel Divisions, A.S.M.E.  
Joined by Machine Shop Practice Division, A.S.M.E.

THE PLACE OF THE ENGINEER IN MODERN LIFE, by Harvey N. Davis, Stevens Institute of Technology.

THURSDAY, OCT. 21

10:00 a.m.—Trellis Room, Ritz-Carlton Hotel  
Iron and Steel Division

EFFECT OF SILICON ON STEELS FOR HIGH TEMPERATURE SERVICE, by H. D. Newell, Babcock & Wilcox Tube Co.

NOTES ON MICROSTRUCTURES AND HARDNESS OF ALLOYS CONSISTING ESSENTIALLY OF IRON, CHROMIUM AND SILICON, by A. G. H. Andersen, Phelps Dodge Corp., and Eric R. Jette, Columbia University.

AN X-RAY STUDY OF THE EFFECTS OF ADDING CARBON, NICKEL, OR MANGANESE TO SOME TERNARY IRON-CHROMIUM-SILICON ALLOYS, by Eric R. Jette, Columbia University, and A. G. H. Andersen, Phelps Dodge Corp.

10:00 a.m.—Main Dining-Room, Ritz-Carlton Hotel  
Institute of Metals Division

AGE HARDENING OF ALUMINUM ALLOYS, III—DOUBLE HARDNESS PEAKS, by W. L. Fink and D. W. Smith, Aluminum Co. of America.

USE OF TELLURIUM IN COPPER-BASE ALLOYS, by H. L. Burghoff and D. E. Lawson, Chase Brass & Copper Co.

SULPHUR, SELENIUM AND TELLURIUM IN COPPER-BASE ALLOYS, by Cyril S. Smith, American Brass Co.

12:15 p.m.—Loggia Room, Ritz-Carlton Hotel  
Luncheon Meeting, Executive Committee, Institute of Metals Division

12:15 p.m.—Dining Terrace, Ritz-Carlton Hotel  
Luncheon Meeting, Open-Hearth Executive Committee

2:00 p.m.—Trellis Room, Ritz-Carlton Hotel  
Open-Hearth Steel Practice

EXTENSIVE CONTROL FEATURES OPEN-HEARTH PRACTICE AT LACKAWANNA, by P. F. Kinyoun, Bethlehem Steel Co.

BASIC OPEN-HEARTH SLAG CONTROL BY THE USE OF THE VISCOSIMETER, by W. J. Reagan, Edgewater Steel Co.

COMBINED CARBON; THE CONTROLLING FACTOR IN QUALITY OF BASIC PIG IRON, by Ralph H. Sweetser, Stuart, James & Cooke, Inc.

PROGRESS REPORT ON THE USE OF VENTURI PORTS IN OPEN-HEARTH FURNACES, by George L. Danforth, Jr., Open-Hearth Combustion Co.

## The Wire Association

MONDAY, OCT. 18

1:00 p.m.—Ambassador Hotel

Directors' Meeting, Program Committee Meeting and Lunch

2:00 p.m.—Ambassador Hotel

FATIGUE PROPERTIES OF HELICAL SPRINGS, by R. R. Tatnall, Wickwire Spencer Steel Co.

TUESDAY, OCT. 19

9:30 a.m.—Venetian Room, Ambassador Hotel

NOTES ON THE ANNEALING OF NICKEL SILVER WIRE IN COILS, by T. C. Meriman, Seymour Manufacturing Co.

NEW DEVELOPMENTS IN MATERIAL HANDLING FOR WIRE MILLS, by A. F. Anjesky, Cleveland Tramrail Division, Cleveland Crane & Engineering Co.

THE MAKING OF STEEL WIRE, Motion Picture by Bethlehem Steel Co.

2:00 p.m.—Venetian Room, Ambassador Hotel

LIME IN WIRE DRAWING, by D. E. Washburn, American Lime & Stone Division of Warner Co.

A.C. ELECTRO-PICKLING, by Allan B. Dove, The Steel Co. of Canada, Ltd.

HANDLING WASTE ACIDS FROM PICKLING OPERATIONS, by H. E. Klein, B. F. Goodrich Co.

WEDNESDAY, OCT. 20

9:30 a.m.—Ambassador Hotel

Ferrous Division

COLD HEADING, by L. S. Cooch, Buffalo Bolt Co.

COLD HEADING DEVELOPMENTS AT G. E. by A. R. Ryan, General Electric Co.

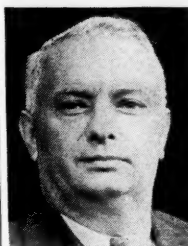
9:30 a.m.—Ambassador Hotel

Non-Ferrous Division

PRODUCTION OF COPPER FROM MINE TO MILL, by Wm. H. Bassett, Jr., Anaconda Wire & Cable Co.

NORANDA ENTERPRISES, Motion Picture.

## Western Metal Congress Leaders



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## A. S. M. E. to Hold Spring Meeting as a Feature of Pacific Coast Program

The program of events for the Western Metal Congress and Exposition, to be held in Los Angeles March 21 to 25, 1938, is rapidly taking shape under the capable direction of a general committee and eight sub-committees.

The American Society of Mechanical Engineers plans to hold its spring meeting in Los Angeles March 23 to 25 during the Congress. This is always

a very well-attended meeting and will bring many additional visitors to the Congress and Exposition.

General theme of the A.S.M. technical sessions will be "Metals in Industry." Subjects of particular interest to the West Coast will be discussed, such as aviation, the oil industry, chemical industry, mining, and general manufacturing.

Headquarters for the Congress will be at the Los Angeles-Biltmore Hotel. The Western Metal Exposition, held in conjunction with the Congress, will be housed in the beautiful Pan-Pacific Auditorium.

2:00 p.m.—Ambassador Hotel  
Ferrous Division

ABNORMAL GRAIN GROWTH AND THE ANNEALING OF LOW CARBON STEEL WIRE, by B. L. McCarthy, Wickwire Spencer Steel Co.

2:00 p.m.—Ambassador Hotel  
Non-Ferrous Division

THE MANUFACTURE OF FOURDRINIER WIRES, by Hugh E. Brown, W. S. Tyler Co.

MODERN NEEDS FOR COPPER WIRE, by L. H. Burnham, General Electric Co.

4:30 p.m.—Venetian Room, Ambassador Hotel  
Annual Meeting of the Wire Association

7:30 p.m.—Ambassador Hotel  
Annual Dinner—Stag Smoker

THURSDAY, OCT. 21

10:00 a.m.—Venetian Room, Ambassador Hotel

A METALLURGICAL STUDY OF THE FACTORS AFFECTING THE QUALITY OF GALVANIZING, by R. W. Sandelin, Atlantic Steel Co.

NICKEL AND NICKEL BASE ALLOYS IN WIRE AND ROD PRODUCTS, by Carl Rolle, International Nickel Co., Inc.

2:00 p.m.—Venetian Room, Ambassador Hotel

COLD DRAWN BARS, by D. W. McDowell, Union Drawn Steel Co.

PRODUCTION OF BOLTS FOR RAILROADS AND BRIDGES, by Charles Fassinger, Oliver Iron & Steel Corp.

THE MAKING OF STEEL WIRE, Motion Picture by Bethlehem Steel Co.

# List of Firms Exhibiting at National Metal Exposition

## Entrance to Exposition Auditorium



Main Entrance From the Boardwalk to the Auditorium, Atlantic City, Where the National Metal Exposition Will Be Held Oct. 18 to 12. A. H. Skean is the efficient director of the Auditorium and manager of the Atlantic City Convention Bureau.

**Air Reduction Sales Co.**, Booth E-62. Welding and cutting torches, brazing and hard facing apparatus.

**Ajax Electric Co., Inc.**, Booth D-37. Electric heat treating furnaces.

**Ajax Electrothermic Corp.**, Booth D-37. High frequency furnaces.

**Allegheny Steel Co.**, Booth C-47. Stainless steels, sheets, bars, plates, strip, tubing, wire, rivets.

**Edgar Allen Steel Co., Inc.**, Booth H-12. Tools and die steels.

**Alox Corp.**, Booth G-11. Rust preventatives.

**Aluminum Co. of America**, Booth G-4. Aluminum alloys.

**American Brass Co.**, Booth G-47. Copper alloys.

**American Bridge Co.**, Booth—stage. (See United States Steel Corp.)

**American Car & Foundry Co.**, Booth G-15. Electric bar heaters, forging heaters, rivet heaters.

**American Chain & Cable Co.**, Booth A-32. Nibbling machines, die sets, welding wire.

**American Coach & Body Co.**, Booth A-73. Spot welders.

**American Cyanamid & Chemical Corp.**, Booth G-79. Case hardening compounds, chemicals.

**American Electric Furnace Co.**, Booth C-39. Electric furnaces.

**American Foundry Equipment Co.**, Booth B-40. Cleaning and descaling equipment.

**American Gas Association**, Gas Section. Gas equipment.

**American Gas Furnace Co.**, Gas Section. Heat treating furnaces.

**American Institute of Mining and Metallurgical Engineers**, Booth A-80. Educational exhibit.

**American Machine & Metals, Inc., Riehle Division**, Booth F-8. Hardness testing machines.

**American Machinist**, Booth G-1. Publications.

**American Metal Market**, Booth G-70. Publications.

**American Rolling Mill Co.**, Booth E-40. Stainless steels, enameling iron, sheets and plates.

**American Screw Co.**, Booth H-85. Bolts and screws.

**American Sheet & Tin Plate Co.**, Booth—stage. (See United States Steel Corp.)

**American Society for Metals**, Booth D-39. Educational exhibit.

**American Steel & Wire Co.**, Booth—stage. (See United States Steel Corp.)

**American Welding Society**, Booth C-3. Educational exhibit.

**Ampco Metal, Inc.**, Booth H-2. High strength non-ferrous alloys.

**Anderson & Sons**, Booth G-2. Etched and lithographed metal products.

**Arcos Corporation**, Booth B-2. Welding accessories.

**Armstrong Cork Products Co.**, Booth G-46. Insulating materials.

**Atlas Fence Co.**, Booth H-45. Industrial fences.

**Audubon Wire Cloth Corp.**, Booth H-45. Mesh, space and flexible wire cloth for industrial applications.

**Automatic Gasflux, Inc.**, Booth A-78. Fluxes automatically fed into gas line for welding operations.

**Automatic Temperature Control Co., Inc.**, Booth B-65. Temperature control systems, control valves for air, gas, water, oil and steam.

**Babcock & Wilcox Co.**, Booth B-14. Refractories.

**Baker & Co.**, Booth A-19. Platinum, gold, silver, precious metals.

**Baldwin-Southwark Corp.**, Booth F-44. Testing machines.

**Barrett-Cravens Co.**, Booth A-10. Industrial trucks.

**Bastian-Blessing Co.**, Booth A-23. Gas welding and cutting equipment.

**Bausch & Lomb Optical Co.**, Booth H-64. Optical instruments for metallography and spectrography.

**Bellis Heat Treating Co.**, Booth A-2. Heat treating salts and furnaces.

**Bethlehem Steel Co.**, Booth D-66. Carbon and alloy steels.

**G. S. Blakeslee & Co.**, Booth A-66. Cleaning and degreasing machines.

**Bonney Forge & Tool Works**, Booth H-83. Drop forgings, wrenches, flanges, welding fittings.

**Botfield Refractories Co.**, Booth B-69. Refractories.

**Bristol Co.**, Booth G-66. Pyrometers, temperature control equipment.

**Brown Instrument Co.**, Booth B-75. Indicating and recording instruments, automatic control equipment.

**Adolph I. Buehler**, Booth B-17. Metallographic equipment.

**Burdett Mfg. Co.**, Gas Section. Gas burning equipment.

**Andrew C. Campbell Div., American Chain & Cable Co.**, Booth A-32. Nibbling machines, die sets, welding wire.

**Carboloy Co., Inc.**, Booth F-48. Cemented carbide tools.

**Carborundum Co.**, Booth H-24. Abrasives, grinding and cutting wheels, refractory products.

**Carnegie-Illinois Steel Corp.**, Booth—stage. (See United States Steel Corp.)

**Chapman Valve Mfg. Co.**, Booth A-15. Chapmanizing process, steel valves.

**Chilton Co.**, Booth H-68. Publications.

**Climax Molybdenum Co.**, Booth C-15. Molybdenum steels and irons.

**Columbia Steel Co.**, Booth—stage. (See United States Steel Corp.)

**Continental Machine Specialties**, Booth B-18. Precision filing and sawing equipment.

**Crown Rheostat & Supply Co.**, Booth F-92. Plating and polishing tools.

**Crucible Steel Co. of America**, Booth B-8. Tool steels.

**Cyclone Fence Co.**, Booth—stage. (See United States Steel Corp.)

**A. P. DeSanno & Son**, Booth H-15. Abrasive cutting equipment.

**Despatch Oven Co.**, Gas Section. Gas heat treating furnaces.

**Detroit Rex Products Co.**, Booth H-35. Metal cleaning equipment.

**Detroit Testing Machine Co.**, Booth H-39. Physical testing apparatus.

**Henry Disston & Sons, Inc.**, Booth A-18. Saws, knives, files, steel and tools.

**Joseph Dixon Crucible Co.**, Booth B-44. Stoppers, nozzles and sleeves.

**Dow Chemical Co.**, Booth G-86. Magnesium alloy die castings, forgings, rolled sheet and plate, and extruded sections.

**Driver-Harris Co.**, Booth F-84. Heat and corrosion resisting castings, carburizing boxes, and furnace parts.

**E. I. duPont deNemours & Co., Grasse Division**, Booth C-10. Pickling inhibitors, fluxes, acids, chemicals for plating.

**E. I. duPont deNemours & Co., R. & H. Chemicals Dept.**, Booth F-14. Heat treating salts, sodium, plating chemicals, metal cleaners.

**Eclipse Fuel Engineering Co.**, Gas Section. Heat treating furnaces and equipment.

**Eisler Engineering Co.**, Booth G-71. Welding machines.

**Electric Arc Cutting & Welding Co.**, Booth C-5. Electrodes, transformers, and generators.

**Electric Furnace Co.**, Booth D-80. Heat treating furnaces.

**Electric Refractories Co.**, Booth H-8. Refractories.

**Electro Alloys Co.**, Booth C-20. Heat and corrosion resisting alloys.

**Electro Metallurgical Co.**, Booth H-52. Alloy steels and cast irons.

**Elevator Supplies Co.**, Booth F-2. Wire drawing machines.

**Ensign-Reynolds, Inc.**, Gas Section. Soft metal melting furnaces, soldering furnaces, burners, gas compressors, air blowers.

**Firth-Sterling Steel Co.**, Booth F-68. Carbide tools, stainless steel products, wear resisting parts.

**Florence Pipe Foundry & Machine Co.**, Booth H-41. Meehanite (high-test iron) castings.

**J. B. Ford Sales Co.**, Booth G-43. Metal cleaners, burnishing compounds.

**Foxboro Co.**, Booth G-36. Measurement and control instruments.

**Gas Machinery Co.**, Gas Section. Forging furnaces.

**Gehrich & Gehrich**, Gas Section. Ovens, dryers, air heaters.

**General Alloys Co.**, Booth E-10. Heat and corrosion resisting alloys, furnace parts.

**General Electric Co.**, Booth A-33. Electric furnaces, atmosphere controls and welding machines.

**General Electric X-Ray Corp.**, Booth A-33. X-ray testing equipment.

**Gloab Division, Carborundum Co.**, Booth H-24. High temperature heating elements.

**Grob Brothers**, Booth G-75. Die making equipment, saws, filing machines, brazing devices.

**Halcomb Steel Co.**, Booth B-8. Tool steels and alloy steels.

**Handy & Harman**, Booth B-35. Brazing alloys and silver solders.

**Harnischfeger Corp.**, Booth C-1. Electric welding equipment and motors.

**Hauck Manufacturing Co.**, Booth A-75. Oil and gas burners, regulating valves.

**C. I. Hayes, Inc.**, Booth B-41. Heat treating furnaces.

**Heat Treating & Forging**, Booth A-70. Publications.

**Haynes-Stellite Co.**, Booth H-52. Cutting tools, corrosion resistant castings.

**Heller Brothers Co.**, Booth L-3. Small tools.

**Hevi Duty Electric Co.**, Booth F-41. Electric heat treating equipment.

**Hobart Brothers Co.**, Booth C-38. Electric arc welding equipment.

**A. F. Holden Co.**, Booth B-32. Heat treating baths.

**Hollup Corp.**, Booth A-62. Electric arc welders, electrodes and arc-welding equipment.

**Charles A. Hones, Inc.**, Gas Section. Gas oven furnaces, melting furnaces, soft metal and soldering furnaces, industrial gas burners.

**E. F. Houghton & Co.**, Booth B-95. Carburizing compounds, heat treating salts, industrial lubricants, cutting oil, leather belting and packings.

**Illinois Testing Laboratories, Inc.**, Booth B-83. Pyrometers, thermometers.

**Illinois Tool Works**, Booth D-10. Cutters, hobs, broaches.

**Industrial Publishing Co.**, Booth F-4. Publications.

**Industrial Steel Casting Co.**, Booth C-91. Steel castings.

**Industry & Welding**, Booth F-4. Publications.

**International Nickel Co., Inc.**, Booth E-75. Nickel and nickel alloys.

**The Iron Age**, Booth H-16. Publications.

**Iron & Steel Publishing Co.**, Booth H-72. Publications.

**Jessop Steel Co.**, Booth G-10. Tool steels and alloy steels.

**Johns-Manville**, Booth C-43. Insulating and refractory materials.

**Jones & Laughlin Steel Corp.**, Booth E-32. Hot and cold rolled steel, tin plate.

**C. M. Kemp Mfg. Co.**, Gas Section. Gas producers and premixers.

**G. N. Krouse**, Booth F-5. Fatigue testing machines.

**Lebanon Steel Foundry**, Booth B-15. Steel castings.

**Leeds & Northrup Co.**, Booth F-63. Heat treating furnaces, pyrometers and controlling instruments.

**E. Leitz, Inc.**, Booth G-14. Photomicrographic apparatus.

**Lepel High Frequency Laboratories**, Booth C-48.

**Lewis Machine Co.**, Booth B-4. Wire drawing machinery.

**Lincoln Electric Co.**, Booth C-32. Electric welding equipment and supplies.

**Lindberg Engineering Co.**, Booth A-67. Heat treating equipment.

**Linde Air Products Co.**, Booth H-52. Welding and cutting apparatus, welding gases.

**Ludlum Steel Co.**, Booth G-95. Tool and alloy steels.

**Maas and Waldstein Co.**, Booth A-6. Lacquers, enamels, synthetics, etc.

**Machinery**, Booth G-67. Publications.

**Macklin Co.**, Booth B-45. Grinding wheels, cut-off machines.

**Magnaflux Corp.**, Booth G-42. Inspection method and equipment.

**Magnetic Analysis Corp.**, Booth G-63. Magnetic analysis equipment.

**Mahr Manufacturing Co.**, Booth B-81. Oil and gas furnaces, burners.

**Manganese Steel Forge Co.**, Booth H-45. Manganese steel wire cloth, screens, forgings, welding wire.

**Manhattan Rubber Mfg. Co.**, Booth G-35. Abrasive cut-off and finishing wheels.

**Marburg Brothers, Inc.**, Booth G-6. Cutting tools, gages, pneumatic hammers.

**Maurath, Inc.**, Booth A-50. Welding electrodes.

**McKay Company**, Booth H-81. Welding electrodes.

**Metal Industry Publishing Co.**, Booth H-79. Publications.

**Metals & Alloys**, Booth L-1. Publications.

**Metal & Thermit Corp.**, Booth F-22. Welding electrodes and equipment.

**Metal Progress**, Booth H-85. Publications and educational exhibit.

**Metals Coating Co. of America**, Booth E-62. Sprayed metal coating equipment.

**Metlab Co.**, Booth D-17. Demonstration of heat treatment of metals.



# Atlantic City Oct. 18 to 22

**Michigan Steel Casting Co.**, Booth F-40 and G-39. Heat and corrosion resisting castings.

**A. Milne & Co.**, Booth H-12. Tool and die steels.

**Minneapolis-Honeywell Regulator Co.**, Booth B-75. (See Brown Instrument Co.)

**Modern Machine Shop**, Booth H-69. Publications.

**Molybdenum Corp. of America**, Booth C-35. Molybdenum and tungsten alloys.

**Morrison Engineering Co.**, Booth C-83. Equipment for wire mills.

**Mullite Refractories Co.**, Booth B-3. Refractories.

**National Carbide Corp.**, Booth E-62. Carbide.

**National Cylinder Gas Co.**, Booth B-22. Oxy-acetylene cutting machines.

**National Gas Furnace Co.**, Booth A-72. Heat treating furnaces.

**National Industrial Publishing Co.**, Booth A-76. Publications.

**National Tube Co.**, Booth—stage. Tubing.

**New Jersey Zinc Sales Co.**, Booth F-32. Zinc alloys, die castings.

**Norton Company**, Booth A-1. Grinding wheels, refractories.

**Ohio Crankshaft Co.**, Booth L-8. Automatically hardened crankshafts.

**Tinius Olsen Testing Machine Co.**, Booth C-18. Testing machines.

**Owen Electric Sales Co.**, Booth C-4. Welding machines.

**Page Steel & Wire Div., American Chain & Cable Co.**, Booth A-32. Welding wire, miscellaneous wire.

**Pangborn Corporation**, Booth A-81. Blast cleaning and dust collecting equipment.

**Paramount Oilless Bearing Co.**, Booth H-75. Oilless wood bearings and bushings, elevator guides, wood turnings.

**Park Chemical Co.**, Booth H-84. Heat treating materials, buffing and polishing materials.

**Parker-Kalon Corp.**, Booth B-21. Screws and fastening devices, measuring instruments, gage blocks.

**Partlow Corp.**, Gas Section. Temperature controls, gas valves, safety pilots.

**Henry Pels & Co.**, Booth F-3. Cutting and fabricating machines.

**George F. Pettinos, Inc.**, Booth A-14. Sands, gravels, insulating cements, graphites, foundry facings, etc.

**Philadelphia Drying Machinery Co.**, Booth B-85. Heating furnaces, oil burners, gas burners.

**Horace T. Potts Co.**, Booth G-72. Iron and steel.

**Product Engineering**, Booth G-1. Publications.

**Production Machine Co.**, Booth F-80. Polishing, finishing and buffing machines.

**Products Finishing**, Booth H-69. Publications.

**Pyle-National Co.**, Booth H-44. Airplane and airport lighting equipment, locomotive headlights, generating sets, etc.

**Pyro-Electric Instrument Co.**, Booth G-40.

**Pyrometer Instrument Co.**, Booth E-17. Radiation, immersion, optical and surface contact pyrometers.

**Quigley Co., Inc.**, Booth H-74. Refractories.

**Republic Steel Corp.**, Booth D-32. Alloy and stainless steels, sheets, bolts and nuts, pig iron, etc.

**Riehle Division, American Machine & Metals, Inc.**, Booth F-8. Hardness testing machines.

**Riverside Metal Co.**, Booth F-10. Non-ferrous alloys.

**Stanley P. Rockwell Co., Inc.**, Booth H-71. Heat treating equipment.

**John A. Roebling's Sons Co.**, Booth A-11. Wire rope and miscellaneous wire.

**Roxalin Flexible Lacquer Co.**, Booth A-86. Flexible lacquers.

**Rustless Iron & Steel Corp.**, Booth A-22. Rustless and stainless steels and irons.

**Joseph T. Ryerson & Son, Inc.**, Booth B-9. Steel and allied products.

**Safety Gas Lighter Co.**, Booth B-36. Gas lighters, gas ranges, hot water heaters.

**George Scherr Co., Inc.**, Booth D-76. Optical instruments and testing machines.

**Scully Steel Products Co.**, Booth—stage. (See United States Steel Corp.)

**Selas Co.**, Gas Section. Gas premixers, burners, soldering systems.

**Sentry Co.**, Booth F-1. Hardening furnaces, high temperature tube furnaces.

**Seymour Mfg. Co.**, Booth F-92. Nickel silver, phosphor bronze, sheets, blanks, wire, rods, shells, etc.

**Shakeproof Lock Washer Co.**, Booth D-10. Lock washers.

**Shenango-Penn Mold Co.**, Booth D-83. Centrifugally cast bronze and bronze products.

**Sleeper & Hartley, Inc.**, Booth H-17. Wire and spring making machinery.

**A. O. Smith Corp.**, Booth C-2. Automotive parts.

**Spencer Turbine Co.**, Booth B-71. Turbo compressors, vacuum cleaners.

**Steel**, Booth L-2. Publications.

**Steel City Testing Laboratory**, Booth F-18. Testing machines.

**Stoody Co.**, Booth H-88. Hard facing materials, cutting tools.

**D. A. Stuart & Co.**, Booth B-44. Industrial oils and greases.

**Surface Combustion Corp.**, Gas Section. Heat treating furnaces, burners, accessories.

**Syncro Machine Co.**, Booth F-2. Wire machinery.

**C. J. Tagliabue Mfg. Co.**, Booth B-41. Indicating, recording and controlling pyrometers.

**Taylor Hall Welding Corp.**, Booth H-75. Welding machines.

**Tennessee Coal, Iron and Railway Co.**, Booth—stage. (See United States Steel Corp.)

**Thermal Products Corp.**, Booth G-17. Insulating materials.

**Timken Roller Bearing Co.**, Booth E-48. Alloy steels.

**Titanium Alloy Mfg. Co.**, Booth F-76. Titanium alloys and compounds.

**Torrington Mfg. Co.**, Booth H-65. Wire manufacturing machines.

**Una Welding, Inc.**, Booth G-22. Welding machines.

**Union Carbide and Carbon Corp.**, Booth H-52. Welding and cutting equipment, ferro-alloys, heat and corrosion resisting alloys.

**Unitcast Corp.**, Booth C-91. Steel castings.

**United States Steel Corp.**, Booth—stage. Alloy steels, high tensile steels, stainless steels.

**Universal-Cyclops Steel Corp.**, Booth H-84. Tool steels, stainless and specialty steels.

**Vanadium-Alloys Steel Co.**, Booth G-32. Vanadium steel, tool steels.

**Vanadium Corp. of America**, Booth H-20. Vanadium alloys and compounds.

**Victor Saw Works, Inc.**, Booth B-39. Hacksaw blades and machines.

**Welding Engineer**, Booth A-42. Publications.

**Wells Mfg. Corp.**, Booth H-21. Metal cutting saws.

**Westinghouse Electric & Mfg. Co.**, Booth E-19. Welding equipment and electric furnaces.

**Wheelco Instruments Co.**, Booth B-84. Temperature control instruments.

**Wiedemann Machine Co.**, Booth A-46. Turret punches.

**H. A. Wilson Co.**, Booth B-7. Platinum alloys, precious metals, thermostatic metals.

**Wilson Mechanical Instrument Co.**, Booth C-50. Rockwell hardness testers.

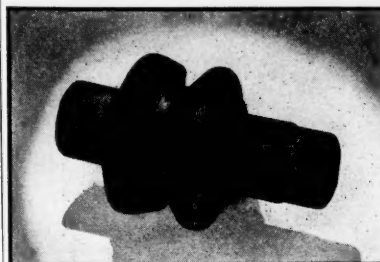
**Wilson Welder & Metals Co.**, Booth E-62. Electric welding machines.

**Wire Association**, Booth A-40. Educational exhibit.

**Youngstown Sheet & Tube Co.**, Booth A-63. Alloy steels.

**Carl Zeiss, Inc.**, Booth G-80. Microscopes and accessories.

## Endicott Develops Forged Chain Sheave



Five-Pocket Chain Sheave

One of the pioneers in the manufacture of stainless forgings, the Endicott Forging & Mfg. Co., Inc., of Endicott, N. Y., has now developed a forged chain sheave having five pockets. Heretofore it has been impractical to make this part as a forging, because of the nature of the design. However, Endicott has developed tools for producing this sheave as a forging, and claim that it not only makes a stronger part, but is also more uniform due to less warpage, fewer failures, less and easier machining.

While this is more or less in its infancy, Endicott contemplates developing this new idea of manufacture for many other lines. Endicott has a large heat and corrosion resisting material business not only in the automotive, aircraft and valve industries but also in many other national markets.

## Maps Available for Those Who Motor to Atlantic City

For the convenience of those who plan to motor to the National Metal Congress in Atlantic City the Gulf Oil Corp. offers a "Tourguide Service."

Maps on which is marked clearly the best route from the member's home to Atlantic City will be mailed upon request. If desired, information concerning various points of historical and scenic interest along the way will be included.

There is no charge for this service. Merely send your request direct to Gulf Oil Corp., 1515 Locust St., Philadelphia, or drop it at any Gulf Service Station.

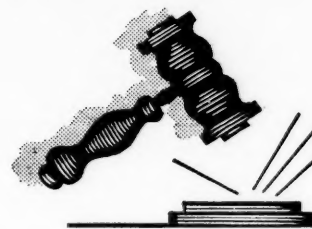
## To Man A.S.M. Booth

Among those in attendance at the A.S.M. booth at the National Metal Exposition will be:

**York Chapter**—George J. O'Neill, William F. Allen, Norman J. Gebert, R. R. Rudisill, and A. Floyd Whalen.

**Philadelphia Chapter**—Henry E. Rowe, H. Smedley Royal, Joseph Gray Jackson, William J. de Mauriac, H. B. Holz, Walter C. Candlin, Thomas J. Moore, Jr., J. B. Janney, Thomas J. Donovan, Richard C. Hirsch, H. W. Scott Deemer, and Arnold D. Spillman.

The New York, Lehigh Valley, Washington, New Jersey, and Baltimore Chapters will also have members stationed at the booth.



## DO I HEAR A MOTION BY THE NATIONAL METAL CONGRESS

in favor of the Seaside? Yes, many members have resolved that all work and no play makes a dull convention. They've resolved to rest and relax in the charming, friendly atmosphere of the Seaside from October 18th to 24th. You come . . . you'll enjoy it.

The Seaside looks out over the ocean and is located just opposite the Steel Pier. You'll like the sun decks, comfortable lobbies, excellent food, and the conviviality of the Surf 'n Sand Room.

Harrison Cook  
Resident Manager



**\* SPECIAL CONVENTION RATES \***  
AMERICAN PLAN ♦ Single Room, with bath, \$6 and \$7 (one person). Double Room, with bath, \$10 and \$12 (two persons).  
EUROPEAN PLAN ♦ Single Room, with bath, \$3 and \$4 (one person). Double Room, with bath, \$5 and \$6 (two persons).



# Seaside

ATLANTIC CITY

Babcock & Wilcox make an insulating fire brick which is refractory as well as insulating and can be used without a facing of firebrick. Description, applications, and engineering data are contained in Bulletin Fy-75.



# Free on Request — Mail Coupons Below

## Annealing

A technical article on annealing in controlled atmospheres has been published by Continental Industrial Engineers, Inc., in a handy little booklet. Diagrams and photographs clearly illustrate the bright annealing furnace described. Bulletin Ny-154.

## Optical Aids

Bausch & Lomb's new catalog lists and describes the instruments and accessories that are especially useful in the metal working industries, such as the toolmakers' microscope, the wide field binocular, the shop microscope, and the Brinell microscope. Bulletin Ga-35.

## Liquitol

The use of Liquitol for controlled cooling of iron and steel castings and ingots is fully described in a bulletin by Alpha-Lux Co., Inc. Bulletin Ma-120.

## Molybdenum

Climax Molybdenum Co. presents their annual book giving new developments in molybdenum, particularly as an alloy with iron and steel. The engineering data presented are made clear by many tables and illustrations. Bulletin De-4.

## Galvanizing

An informative, historical, simple digest of galvanizing forms a guide to longer life for iron and steel products. This handsome, handy, 24-page book beautifully printed in color is distributed by American Hot Dip Galvanizers Association, Inc. Bulletin Ea-167.

## Photoelectric Balance

C. J. Tagliabue Mfg. Co. has christened its newest, simplest and fastest recording potentiometer the "Celestray" from the photocell, electric current and light ray by means of which it operates. Described in Bulletin Ea-62.

## Dipping Baskets

The fourteen standard designs of dipping baskets made by The C. O. Jelliff Mfg. Corp. are catalogued in a folder containing additional information on the types of metals most suitable for use with various cleaning and pickling cycles. Bulletin Sy-78.

## New Homo Furnace

The new Homo furnace described in a bulletin issued by Leeds & Northrup provides for even tempering on a very dense load. Automatic control includes a feature that prevents overshooting. Fine tempering on extra dense loads at low cost is provided. Bulletin Mx-46.

## Hydraulic Tester

Of interest to all engineers recommending or purchasing universal testing machines is a book by Riehle Division of American Machine and Metals, Inc., on the development of the precision hydraulic testing machine. Bulletin Ba-157.

## Thermal Analyzer

Laboratory furnace equipment designed to conduct grain size tests, creep tests, thermocouple calibration, coefficients of expansion, combustion analysis, gas atmosphere experiments, dilatometry, and general thermal exploration. Also for precision heat treatment. Stanley P. Rockwell Co. Bulletin Ay-121.

## Scleroscopes

Shore Instrument & Mfg. Co. describes its Model D standard recording scleroscope in a recent bulletin which explains the theory and practice of hardness testing with this machine. Bulletin S-33.

## Recuperators

Results obtained with Carborundum Company's recuperators using Carbofrax tubes are fuel savings, closer temperature control, faster heating, and improved furnace atmosphere. Complete engineering data are given in Bulletin Fx-37.

## Salt Bath

"Heating from the inside out" is what makes the Ajax-Hultgren salt bath furnace practical. Ajax Electric Co. explains this new operating principle in an interesting folder. Bulletin Oy-43.

## Alloy Steels

Why alloy steels are best for heavy equipment and other exacting applications is discussed in a folder by Bliss & Laughlin, Inc. A partial list of the more common grades gives machine ratings and turning speeds. Bulletin Jy-42.

## Casting Problems

Unusual casting problems that were solved by the use of National Alloy Steel Co.'s oxidation, corrosion, and abrasion resisting castings are shown in a clever pictorial manner in an attractive folder. Bulletin Ox-104.

## Steel Data Sheets

Wheelock, Lovejoy & Co. gives analyses, physical properties, heat treating instructions, and applications of Hy-Ten, Economo, and S.A.E. alloy steels in concise and easily usable form. Bulletin Ox-74.

## Brinell Tester

Accurate and exact measurements can be made on hard or soft materials with the Diamo-Brinell hardness testing machine, which uses a pyramid-shaped diamond instead of a steel ball. Described in a pamphlet by Pittsburgh Instrument and Machine Co. Bulletin Aa-1.

## Instrument Slide Rule

An ingenious slide-rule indicator devised by Westinghouse Electric & Mfg. Co. selects the proper instruments for any application, whether central stations, industrial plants or transportation industry. It shows at a glance what instruments to use, their range, approximate price, size, and descriptive literature available. Bulletin Ia-134.

## Chromel

A new catalog has been issued by Hoskins Mfg. Co. covering Hoskins electric furnaces and Chromel elements, which provide uniform heat and automatic temperature control with excellent production and quality of work. Bulletin Ia-24.

## Tempering

Vertical batch type tempering furnaces are described in a folder by Industrial Heating Equipment Co. Capacity and production figures and a diagram of the furnace are included along with a complete description. Bulletin Ia-168.

## Pipe Lines

Latest information on the construction of pipe lines by electric welding for transportation of oil, gas and water is contained in a bulletin by Lincoln Electric Co. Fourteen pages, profusely illustrated. Bulletin Ia-10.

## Scale-Free Hardening

General Electric scale-free hardening furnaces for either large or small volume of production, ferrous or non-ferrous applications, box or continuous type, are accurate and automatic. Described in Bulletin Ia-60.

## Explosion Protection

A gas burner safety device designed to prevent explosion made by Wheelco Instruments Co. is known as the Flame-otrol. Illustrations, data, operating diagrams and prices are fully covered in Bulletin Ia-110.

## Cement

"Hytemite" is a high temperature cement for laying up firebrick with thin, long-lasting, air and gas tight joints of great strength, made by Quigley Co. How it saves time and labor and cuts construction and maintenance costs is told in Bulletin Ia-139.

## Furnace Parts

A valuable feature of Driver-Harris Co.'s folder on Nichrome cast furnace parts is a table giving the tensile strength of Nichrome castings at various temperatures. Bulletin Da-19.

## Pickling

All current pickling procedures and practices were carefully studied, analyzed, summed up and compared in the preparation of a 32-page handbook on pickling steel with modern inhibitors by E. F. Houghton & Co. A frank, instructive manual. Bulletin Ia-38.

## Pyromaster

Bristol Co.'s "Pyromaster" is a recording potentiometer with a round chart and direct ink marking. Its applications as a pyrometer, resistance thermometer, tachometer and millivoltmeter are given in Bulletin Ia-87.

## Rustproofed Steel

Atmosphere does not corrode steel which has been rustproofed with Duozinc, a mercury-containing zinc anode with marked production properties. Full details are given in a folder issued by the R. & H. Chemicals Dept. of duPont. Bulletin Ar-29.

## Cutting Oils

The problems of machine tool lubrication engendered by the high speed production and close tolerances of modern industrial operations are discussed and progress in cutting oils during the past few years reviewed in a booklet by D. A. Stuart & Co. Bulletin Jy-118.

## Heat Resisting Alloys

Authoritative information on alloy castings, especially for chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in Bulletin D-17.

## Centrifugal Castings

Centrifugal casting of stainless, heat and corrosion resisting alloys eliminates impurities and cooling strains and permits thinner and more uniform walls than any other method. This is explained in a bulletin by Michigan Steel Casting Co. Bulletin Nx-84.

## Air Weight Control

An illustrated booklet of sure-fire interest to the foundry trade has been issued by The Foxboro Co., explaining in detail the advantages of the "air weight controller" which is in use at many of America's leading foundries, named in the publication. Bulletin Ea-21.

## Automotive Furnaces

Nowhere does heat treating play a more essential part than in the construction of the motor car. Gas-fired heat treating furnaces designed especially for use by the automotive industries are illustrated and described in a booklet by Surface Combustion Corp. Bulletin Ia-51.

## Compressor Data

General information on the application of blowers to gas and oil burners, and miscellaneous applications for other types of work are included in a 12-page "Turbo-Compressor Data Book." Useful tables and charts are included. Spencer Turbine Co. Bulletin Dy-70.

## Neophot

"Neophot" is the name of a new metallograph of radically new design and universal adaptability. A pamphlet distributed by Carl Zeiss, Inc., gives its applications and features and is well illustrated with beautiful samples of micrographic work. Bulletin Jx-28.

## Rockwell Tester

A revised and completely up-to-date catalog on the well-known Rockwell hardness tester is well illustrated and contains 24 pages. Published by Wilson Mechanical Instrument Co., Inc. Bulletin Ca-22.

## Hy-Speed Case

50 to 500% increase in the life of high speed steel tools is claimed in a striking and interesting new booklet just published by the A. F. Holden Co. Typical cases of these savings are cited. Bulletin Fa-55.

## Defi Rust

Analysis and descriptive notes of nine types of heat and corrosion resisting steels made by Rustless Iron and Steel Co. are contained in a handsome folder. Bulletin Ha-169.

## Metallograph

Leitz Large Micro-Metallograph "MM-1"—most interesting 36-page publication containing numerous photomicrographs on the very latest developments in metallographic equipment. Special attention is given to darkfield illumination. Bulletin Ha-47.

## New Joining Process

Metal parts are joined cheaply, neatly and strongly by Electric Furnace Co.'s new, inexpensive non-oxidizing furnace atmosphere and their new, continuous brazing, coppering and soldering furnaces. Full details are given in Bulletin Ar-30.

## Cleaning Processes

An attractive 12-page booklet entitled "Scientific Metal Cleaning" has been published by Detroit Rex Products Co. It describes in detail the applications and advantages of Detrex degreasing with Perm-A-Clor or Triad Safety Solvents and the applications of Triad Alkali Cleaning Compounds and Strippers. Bulletin Oy-111.

## Testing Machines

An extremely handsome, spiral-bound, segregated catalog tells all about the various hydraulic and screw power testing machines made by Tinius Olsen Testing Machine Co. Bulletin Oy-147.

## Oxidation

Designers confronted with oxidation problems connected with cracking coils, polymerization plants, superheaters, high pressure steam plants, air heating equipment and recuperators will welcome a folder by Timken Roller Bearing Co. containing data on oxidation at 1000, 1250 and 1500° F. Bulletin Ea-71.

## Alloy Castings

Michiana Products Corp. has published a new book describing Michiana corrosion resistant and stainless steel alloys. Generously illustrated, it suggests many savings for the use of these alloys. Bulletin Oy-81.

## Metal Heating

Improvements in furnace economies, operating conditions and appearances, furnaces that will more satisfactorily meet old requirements or handle new processes, service that will help solve the most stubborn problems are offered and described by Mahr Mfg. Co. in Bulletin Ea-5.

## Meehanite

A compact but complete specification chart gives the recommended grades of Meehanite metal for various service requirements. Complete physical properties and applications are included. Bulletin Da-165.

## Cutting Steel

Recommended practices for gas cutting of structural steel are given in a concise and authoritative form by The Linde Air Products Co. Qualification tests for good workmanship from the standpoint of accuracy and smoothness of cuts are also described. Bulletin Dc-63.

## The Review

7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following literature. Circle the numbers that interest you. It is important to write in your company or business connection when you return this coupon.

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## Newer Tool Steels

Vulcan Crucible Steel Co. has a complete and attractive catalog listing their full line of tool steels including many special types to meet the modern trends in industry. Bulletin Jy-127.

## Chapmanizing

Chapmanizing, the new method of surface hardening steel with nitrogen, is described in a very attractive booklet of Chapman Valve Mfg. Co. Information is given out on the method itself and on its metallurgical advantages. Bulletin Ob-80.

## Tempering Furnace

Technical details and operating data on Lindberg Steel Treating Co.'s new Cyclone electric tempering furnace, which has shown a remarkable performance record in steel treating operations, are given in Bulletin Fx-66.

## Ni-Cr Castings

Compositions, properties, and uses of the high nickel chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

## Electric Salt Baths

Literature is available from Bellis Heat Treating Co. describing electrically heated bath furnaces which are economical to operate and have a wide range of applications in hardening, annealing and heat treatment of high speed steel, stainless steel, nickel, aluminum, copper and bronze, etc. Bulletin Ny-48.

## Copper Bulletin

A new clearing house for news of developments in brass, bronze, and copper, the "Copper Alloy Bulletin," issued by the Bridgeport Brass Co., made its appearance with the March issue. It is edited for the technical and engineering audience. Bulletin Da-163.

## Stainless Data Book

All users of stainless and heat resisting alloys should find invaluable the information contained in a booklet published by Maurath, Inc., giving complete analyses of the alloys produced by the different manufacturers, along with the proper electrodes for welding each of them. Bulletin Jy-125.

## Laboratory Service

A new edition of "The Metal Analyst" tells about an organization established by Adolph I. Buehler specializing in the installation of metallurgical laboratories. The complete line of laboratory equipment marketed by Buehler is also catalogued. Bulletin Dy-135.

## Nickel-Copper Steels

Exceptional resistance to corrosion and abrasion, increased tensile strength, and higher ductility are the qualities claimed for Youngstown Sheet & Tube Co.'s new series of Yolo steels. A summary of properties and notes on their characteristics are contained in Bulletin Ox-93.

## Cold Finished Facts

Leather-bound, looseleaf, and tabbed for easy reference, a handbook by Wyckoff Drawn Steel Co. on cold finished steels abounds in useful technical information on machinability, heat treatment, selection of steels, and weight tables. Bulletin Ka-99.

## Baking Ovens

Fan refrigerators, air conditioning units, oil burners, bed springs, switch boxes, motor parts, steel furniture, stove and furnace parts, the various types of finish baking and drying ovens made by Despatch Oven Co. are described in Bulletin Ka-123.

## Polishing Machine

A reprint of an article from the A.S.M. Transactions by O. E. Romig and J. C. Whetzel is supplemented by photographs, specifications, and other information on the Cincinnati Electrical Tool Co.'s new metallographic polishing machine. Bulletin Ox-97.

## Uniform Temperature

Temperature Uniformity is the title of an interesting bulletin describing Carl-Mayer furnaces for tempering, drawing, aging and heat treating. With temperature uniformity so important to efficient furnace operation, every heat treater will want this literature. Write for Bulletin Ka-183.

## Dayton Officer to Be Honored at Banquet

Fred M. Reiter, industrial gas engineer, The Dayton Power & Light Co., Dayton, Ohio, came of age as secretary of the Dayton Chapter with his re-election last spring to serve a tenth consecutive term. He will therefore be a guest of the Society at the National Metal Congress in Atlantic City the week of Oct. 18.

Fred Reiter

In recognition of his loyal service over so long a period of years, Mr. Reiter will be a guest of honor at the annual banquet of the Society and will be seated at the speakers' table.

## Largest Organ in World Will Be Heard During Metal Expo

A real treat is in store for lovers of pipe organ music at the National Metal Exposition.

William H. Jackson, featured pipe organist of reputation, has been engaged for the entire Convention. He will play the organ in the Ballroom of the Auditorium, which is the largest theatrical pipe organ in the world, an instrument of excellent quality and power.

In addition to this, he will perform at opportune times on the \$1,000,000 organ in the Main Auditorium. This organ is a wonder in itself, being by far the largest organ of any type in the world, operated from two giant consoles, each possessing six manuals, affording a total of 1000 stops.

The organ has 32,000 pipes of unprecedented size, the largest 64 ft. in length. It operates at a pressure ten times that normally used in large organs and at least twice that in the "Cathedral" at Liverpool, hitherto the most powerful organ in the world.

### No R. R. Certificates

Due to the recent reduction of railroad fares in all parts of the country, no reduced fare railroad certificates will be issued to members of the Society attending the National Metal Congress in Atlantic City.

## Alnor Pyrometer Controls Temperature Automatically

A pyrometer controller sold under the trade name "Alnor" is offered by Illinois Testing Laboratories, Chicago, which automatically controls temperatures of heat treating furnaces, melting pots, or other heating devices at a predetermined point.

The principle of operation is electronic, similar to a radio circuit. Neither motor nor depressor bar is used in the Alnor controller, nor is there any direct contact between the vanes. The temperature indicating pointer is free to give continuous indication and control.

A red bull's-eye indicates whether the heat in the furnace is on or off. All Alnor pyrometers have hand-drawn scales (not printed) at no extra cost, which assures maximum accuracy.

The case of the pyrometer is weather-proof, fume proof, and dust tight.

## German Travelers Will Visit Congress on Last Day

Visitors to the National Metal Congress and Exposition on the last day, Friday, Oct. 22, will include a group from Germany—members of the *Wirtschaftsgruppe Nichtmetall-Industrie*, a German organization devoted to industrial non-ferrous interests.

These men will be on a conducted tour of non-ferrous plants in the United States. The itinerary has been arranged so that the group leaves Germany Oct. 8, visits non-ferrous interests in New York, Niagara Falls, Detroit, Chicago, and Philadelphia, with final stops at Atlantic City and Washington, and returns to Germany Nov. 2.

The Metal Congress is being advertised as one of the foremost attractions of the trip.

## Philadelphia to Sponsor Special Expedition to A. C.

Adolph O. Schaefer, assistant engineer of tests, The Midvale Co., and vice-chairman of the Philadelphia Chapter, A.S.M., will have charge of a special expedition to Atlantic City on Friday, Oct. 22, the last day of the National Metal Congress and Exposition.

A. O. Schaefer

This is being arranged for the convenience of members and others connected with the metal industry in Philadelphia who will be unable to spend the entire week at the Congress.

## Service Clubs to Meet

The Rotary Club, Exchange Club, and Kiwanis Club will all hold luncheon meetings during the National Metal Congress in Atlantic City.

The Rotary Club will meet on Tuesday, Oct. 19, at 12:30 at the President Hotel.

The Exchange Club will have its luncheon on Wednesday, Oct. 20, at 12:30 at the Senator Hotel.

The meeting of the Kiwanis Club will take place on Thursday, Oct. 21, at 12:30 at Hackney's Restaurant.

## Employment Service

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

**METALLURGIST:** B.S. Metallurgical Engineering. Six years' experience in the manufacture of locomotives, tractors and road machinery. Two years' experience in steel mills. Served as chief chemist, industrial engineer, heat treat superintendent, and plant metallurgist. Box 10-5.

**METALLURGIST:** Age 27. Now in charge of cupola and malleable furnace operation, materials specifications and concrete-bonded sand molding in large iron foundry. B.S. in Electro-Chemical Engineering. Also experienced in the processing of copper and its by-products. Box 10-10.

**SUPERVISOR** of heat treating or tool hardening. Has studied metallurgy and metallography. Four years' experience in commercial heat treating plant. Four years' general supervision of heat treating in production manufacturing plant. Capable of checking and repairing pyrometers. Box 10-15.

**METALLURGIST:** Long experience in cleaning and pickling of metals. Executive ability. Capable of managing cleaning and pickling department. Author of technical articles. Box 10-20.

**METALLURGIST:** Has had charge of physical and metallographic laboratories, heat treating, plant and laboratory research. Has devised improvements in processing of high speed steel and in melting practices. B.S. in Metallurgical Engineering. Box 10-25.

### Position Open

**PLANT MANAGER:** Man with practical experience qualified to lay out and manage a plant for the production of titanium on West Coast. Write stating past experiences, qualifications, salary desired. Box 10-30.

## Committee on Hotels in Position to Provide All Types of Accommodations

In order to provide the best possible hotel accommodations for visitors to the National Metal Congress and Exposition in Atlantic City, Oct. 18 to 22, a special Committee on Hotels has been appointed. All reservations will be handled by William B. Coleman, Chairman, Committee on Hotels, 16 Central Pier, Atlantic City, New Jersey.

W. B. Coleman

Mr. Coleman, who is a past president of the A.S.M., is in a position to provide accommodations at 28 hotels of all types and price ranges. Merely fill in and mail the coupon below, and he will see that your requirements are met.

Special convention rates are in effect

## Ambassador Pool to Be Open

Special bathing arrangements have been made at the Ambassador Hotel, Atlantic City, for members attending the National Metal Congress and their families.

The Ambassador has a fine, indoor, salt-water pool. Fees for those attending the Congress are 35c using the owner's suit, and 60c using a suit rented from the Hotel.

during the National Metal Congress which are much lower than the usual summer rates.

The Ambassador Hotel is headquarters for the American Society for Metals and the Wire Association, the Ritz-Carlton is headquarters for the American Institute of Mining and Metallurgical Engineers, and the Traymore is headquarters for the American Welding Society.

Make your hotel reservation today!

## Airline Service Available To Atlantic City Congress

Airline service from all parts of the United States to Atlantic City is available to those who desire to utilize this speedy form of transportation to attend the 1937 convention of the American Society for Metals Oct. 16 through 22, according to word received from the Convention Bureau of United Air Lines.

New low fares are now in effect, making air travel this year more economical than ever before. United's special circle tour arrangements will permit air travelers to visit both Philadelphia and New York without payment of extra fare.

Detailed information on any air or air-rail trip may be obtained by writing to any United Air Lines ticket office or any other airline office, travel agent, or telegraph office.

## Atlantic City Hotels

### SCHEDULE OF RATES ALL ROOMS WITH BATH

BOARDWALK HOTELS		— EUROPEAN ROOM — For 1 Person	PLAN ROOM For 2 Persons	Person for Three Meals
*AMBASSADOR, Boardwalk at Brighton Ave.	.....	\$3.00-\$5.00	\$5.00-\$10.00	\$4.00
BRIGHTON, Boardwalk at Indiana Ave.	.....	3.00- 5.00	5.00- 8.00	3.50
CHALFONTE-HADDON HALL, Boardwalk at N. Carolina Ave.	.....	3.00- 5.00	5.00- 10.00	3.50
CHELSEA, Boardwalk at Morris Ave.	.....	3.00- 5.00	5.00- 8.00	3.00
CLARIDGE, Boardwalk at Park Pl.	.....	4.00- 9.00	5.00- 11.00	4.00
DENNIS, Boardwalk at Michigan Ave.	.....	3.50- 6.00	5.00- 10.00	3.00
KNICKERBOCKER, Boardwalk at Tennessee Ave.	.....	3.00- 4.00	5.00- 7.00	3.00
MARLBOROUGH-BLENHEIM, Boardwalk at Ohio Ave.	.....	4.00- 6.00	5.00- 11.00	3.00
NEW BELMONT, Boardwalk at Ocean Ave.	.....	2.50- 3.00	4.00- 6.00	E. P. Only
*RITZ-CARLTON, Boardwalk at Iowa Ave.	.....	3.00- 6.00	5.00- 10.00	3.00
SEASIDE, Boardwalk at Penna. Ave.	.....	3.00- 4.00	5.00- 8.00	3.00
SHELBURNE, Boardwalk at Michigan Ave.	.....	4.00- 6.00	5.00- 8.00	E. P. Only
**TRAYMORE, Boardwalk at Illinois Ave.	.....	3.50- 10.00	5.00- 12.00	3.00

### AVENUE HOTELS

ARLINGTON, 116 S. Michigan Ave.	3.50-4.00	5.00-8.00	2.00
COLTON MANOR, 110 S. Penna. Ave.	3.00-4.00	5.00-7.00	2.00
FLANDERS, 127 St. James Place	3.00-4.00	5.00	2.00
FRANKLIN INN, 157 S. Virginia	2.50	4.00	2.00
GLASLYN-CHATHAM, Park Pl.		5.00	2.00
JEFFERSON, 136 S. Kentucky Ave.	3.00-3.50	5.00-6.00	2.50
KENTUCKY, 126 S. Kentucky Ave.	2.50	4.00	E. P. Only
LAFAYETTE, 109 S. No. Carolina Ave.	3.00-4.00	5.00-7.00	2.00
MADISON, 123 S. Illinois Ave.	3.00-4.00	5.00-7.00	2.50
MONTICELLO, 131 S. Kentucky Ave.		5.00	2.00
MORTON, 150 S. Virginia Ave.	2.50-3.50	4.00-6.00	2.50
PRINCESS, 144 S. So. Carolina Ave.	2.50	4.00	2.00
SENATOR, 168 S. So. Carolina Ave.	3.00-4.00	5.00-7.00	2.50
STERLING, 144 S. Kentucky Ave.	2.50-3.00	4.00-5.00	2.00
THURBUR, Atlantic and Mass. Aves.	2.50	4.00	E. P. Only

\*Headquarters—A.S.M. & Wire Ass. \*\*Headquarters—A.I.M.E. \*\*\*Headquarters—A.W.S.

William B. Coleman, Chairman Committee on Hotels  
16 Central Pier, Atlantic City, New Jersey

Please reserve as first choice hotel.

As second choice hotel.

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